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PRINCIPLES OF EXODONTIA AS APPLIED TO THE IMPACTED MANDIBULAR THIRD MOLAR

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PRINCIPLES OF EXODONTIA
AS APPLIED TO THE

Impacted Mandibular Third Molar

A COMPLETE TREATISE ON THE OPERATIVE TECHNIC WITH CLINICAL DIAGNOSES AND RADIOGRAPHIC INTERPRETATIONS

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DRAWINGS BY TOM JONES

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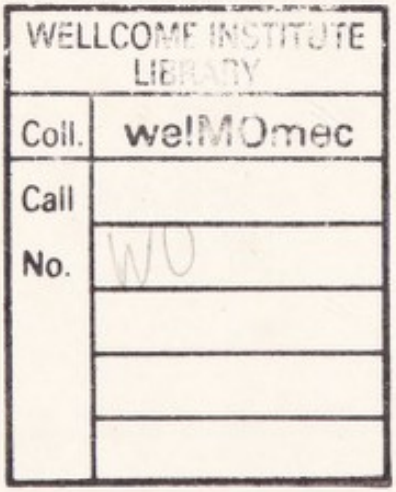

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PREFACE

IN preparing this volume on the operative technic for the extraction of impacted mandibular third molars, it is the aim of the author to present a complete treatise on this important subject, embracing all the details connected with the various phases of the operation. The operative technic described is based on the clinical examination and the radiographic interpretation of the impacted tooth and its supporting structure. The object to be attained is the elimination of explorative manipulation in advance of or during the operation, and to substitute for guesswork a definite method for the procedure, so as to decrease materially the trauma and avoid the complications that are usually associated with the extraction of the tooth.

The various types of impacted mandibular third molars illustrated in this book have been classified into groups of similar types of cases, for which purpose several thousand cases of impacted molars were selected in order to make a complete classification. Each type has been carefully analyzed, and the steps for the operative procedures for the various types are graphically illustrated and minutely described. All the illustrations shown have been prepared especially for this book, and have been made as well as can be produced by photographic art and mechanical skill.

The forceps and surgical bur, as well as the long-handled chisel and mallet, so generally used, have been eliminated. The operative technics described for the various types of impaction may at first appear to the reader to be a radical departure from former procedures, but the technics described are the result of years of research and labor, and present a standardized system of operative procedure. The various steps that are described for each operative technic have been frequently executed in actual practice, giving assurance that the technic presented is according to a definite procedure from a practical standpoint.

Archimedes, the celebrated Greek mathematician, is said to have declared that if given a proper fulcrum, he could move the world with a lever; this indicates the concentrated power possessed by a lever action. With a lever action an impacted mandibular third molar can be extracted with less trauma than with forceps if the operator can secure a suitable fulcrum for the lever, and a fulcrum is available in the majority of cases. To secure a suitable fulcrum, a study should be made, in advance of any operative procedure, of the position of the crown, the character of the root formation and the nature of the ossistructure surrounding the impacted molar, in addition to which careful consideration should be given to the condition of the second molar.

The special purpose of this book is to present to the dental profession an operative procedure for the extraction of an impacted mandibular third molar that is based on a definite method of execution. There is sufficient reason to believe that if the operator will follow the directions for making a correct radiogram and intelligently interpret the delineations it presents, he will have a guide to assist him in performing a successful operation. If the operator should be in doubt at any time as to the particular technic to be applied in a certain case, he can refer to a corresponding type described in this book and follow the directions. When at another time a similar case is presented, a recheck can be made of the condition, and the operative procedure to be followed will be readily visualized by the operator.

Neither the instruments indicated nor the technical procedures described are designated in an arbitrary manner. The instruments illustrated are the ones with which the author has been able to achieve the most satisfactory results with the least amount of injury to the supporting structure.

G. B. W.

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CHAPTER I

Impacted Mandibular Third Molar

THE mandibular third molar is more frequently found impacted than any other tooth. Impaction of this tooth is usually a menace to the patient, creating a great deal of discomfort, disarranging the dental arch by causing an unnatural pressure at the site of the affection, and often causing a loss of the second molar. In addition to these conditions, the presence of a pathologic condition is not unusual.

It is claimed in treatises on anatomy that no two anatomic structures of the same kind are exactly alike in every detail, and it can be said with an equal degree of assurance that it would be difficult to find two impactions of the mandibular third molar that are identical in every particular. Assuming that this assertion in regard to impactions is correct, it would be impossible to describe properly a technic for the extraction of an impacted mandibular third molar without a scientific basic principle on which to establish the technical procedure.

The author has endeavored to classify the various types of third molar impaction, basing the method of classification on the four salient points of identification: the position of the crown, the character of the root formation, the nature of the ossistructure surrounding the tooth and the position of the third molar in relation to the second. The classification that has been arranged is considered to be of sufficient diversity to make it possible to describe the technical procedures for extraction in the various cases of third molar impaction that may occur in practice.

It is possible that a case will occur which is different in some minor detail from the types described, and in such case the technic may be modified to conform to the variation that may be presented. The principal object has been to arrange a series of classifications to which appropriate scientific technics could be respectively applied, allowing any necessary modification to be made in such variant cases as may subsequently occur. As is the case with other methods of operating on the human body, the technics of third molar extraction are subject to such future modifications and improvements as may be indicated by existing conditions and later experiences.

The technic described is designed to reduce trauma, and the author has found that a minimum amount of trauma will result where a proper execution of an exolever technic instead of a forceps technic is followed. It should, therefore, always be the endeavor of the operator to apply

the exolever technic, utilizing such fulcrum as may be available in close proximity to the impacted tooth.

It is recognized that in all surgical procedures performed on the human anatomy the prognosis of the case is most favorable where there has been little manipulation of the parts involved; that is to say, reducing manipulation decreases the injury and lessens the postoperative discomfort.

An impacted third molar should be extracted, as a rule, without disturbing the second molar. An exceptional cause for the extraction of the second molar will, however, be presented where the distal root of the second molar is affected by caries or pressure absorption, or where a pathologic condition has caused a destruction of the roots of that tooth and it cannot in any of these cases be restored as a useful organ of mastication.

To treat a case of impaction in any other manner than as an operative procedure when the tooth is in an abnormal position and is causing discomfort, or is liable to injure the second molar, will not be of any practical benefit. The most common type of impaction that causes a disturbance is where the gum tissue covers a part of the occlusal surface. In such case débris readily collects under the gum tissue folds, decomposition sets in and infection is established. It was once the belief that palliative treatment of such a case was all that was necessary; but syringing and applying medication give only temporary relief. If a radiogram is made of a case of this character, it is usually found that infection has attacked the ossistructure, and, as a rule, is located distal or mesial to the crown.

The general public expects improved exodontia service, and particularly is such service sought by patients afflicted with impacted teeth. It should, therefore, be the aim of the conscientious operator so to conduct the operation, of whatever nature it may be, as to obtain ideal results.

Not to exercise a proper degree of circumspection in these matters may result in an unpleasant termination, and one that a conscientious operator wishes to avoid. When, however, every step preceding, during and following the operation has been judiciously taken, the result should be pleasing to the patient and gratifying to the operator.

The etiology of an impaction is a moot question, the specific causes varying in different persons, and no discussion of that feature will be undertaken. An effort will, however, be made so to describe the various conditions which the different phases of impactions may present in the oral cavity as to enable the operator to visualize and comprehend those conditions.

CHAPTER II

Clinical Examination

EXPERIENCE has demonstrated that the successful extraction of an impacted mandibular third molar with a minimum amount of trauma depends on a correct clinical examination and radiographic interpretation in conjunction with an operative technic that is applicable to the type of case presented.

In order that the operator may have uniform success in the extraction of an impacted mandibular third molar, he should, before attempting to extract the tooth, make a careful clinical examination of any exposed part of the crown and the gum tissue surrounding the tooth, closely observing, where practicable, the interproximal space, and noting the condition of the second molar.

In that type of case where the impacted mandibular third molar is isolated, the second molar having been previously extracted, the clinical examination is just as important as if the second molar were present. The third molar on the opposite side to the one under consideration for extraction should be examined and also both maxillary third molars. If a previous attempt has been made to extract the impacted tooth, the condition resulting from such an attempt should be noted.

It is true that in many cases an operation may be successfully performed after only a clinical diagnosis has been made, in which case the operation will be done with some degree of guesswork, as the operator will have no knowledge of the character of the supporting ossistructure or of the root formation, and there will be the possibility that unexpected resistance may be encountered, that unnecessary trauma may be caused or that there may be a fracture of the crown, roots or ossistructure, which incidents, if any should occur, could have been avoided if the precaution has been taken to make a radiogram of the tooth, supporting ossistructure and second molar.

A general survey should be made of the condition of the oral cavity and the care that has been given to the hygiene of the mouth, as these features are important factors in the prognosis of the case. A notation should be made of any infection that may be found in or about the mouth, and, wherever practicable, any existing abnormality should receive corrective attention in advance of any operative procedure. The general physical condition of the patient should be noted and as complete a history as possible obtained.

When the conditions that were unfavorable to operating have been

remedied to the extent that circumstances will permit, and the extraction of the tooth is indicated, the examination of the exposed part of the crown is the first step to be taken in the clinical examination.

Examination of Exposed Part of Crown.—The exposed part of the crown of an impacted mandibular third molar should be clinically examined, as by such examination much valuable data can be obtained, which may be subsequently verified by the radiogram.

The examination of the exposed part of the crown of an impacted mandibular third molar should be made by an ocular and digital examination and with the aid of the probe. The blade of the probe is used to displace the gum tissue, wherever possible, without causing trauma of the surrounding tissue. The same instrument may be used for a similar purpose when an anesthetic has been administered in a case of deep-seated impaction, and where the gum tissue has been incised to permit such an examination, but such a procedure will not be necessary in the majority of cases where the operator can have recourse to a radiogram as a guide for his diagnosis.

The exposed part of the crown should be carefully examined (1) to determine the position of the tooth, the size and shape of the part exposed and the alignment of the occlusal and distal surfaces of the second molar with the occlusal and mesial surfaces of the third; (2) to ascertain whether the buccal surface of the crown of the third molar is in alignment with the buccal surface of the second, or whether the crown of the third molar is deflected lingually or buccally out of alignment with the buccal surface of the second, and (3) to determine the character of the contact of the crown of the third molar with the crown or distal root of the second.

Where any part of the crown is exposed, the operator should examine clinically, if possible, the location of the buccal surface for the purpose of learning whether there is a torsion of the crown. This procedure is important in order to determine the exact point where the exolever is to be applied to the buccal surface of the tooth, and especially should this precaution be followed in a vertical or an angular type of impaction.

This examination, made with an exploring instrument, is for the purpose of locating the buccal groove, which may, if there is a torsion, be in one of the various locations to which it is subject, and it will be the guide for locating the bifurcation of the roots on the buccal surface.

The most prevalent cases in which part of the crown is exposed are impactions in mesioangular and horizontal positions. In the latter class the distal surface is often exposed to the view of the operator. Where the tooth is not in either of these positions and the crown is in a vertical or distoangular position, a part of the occlusal surface is often exposed.

Examination of Gum Tissue Over and Around Crown.—A thorough clinical examination should be made where the gum tissue is over a part or the whole of the crown of the impacted third molar, and the amount of tissue that extends over the occlusal, mesial, distal, buccal and lingual surfaces should be determined before any attempt is made to operate. This examination is made for the purpose of ascertaining the most favorable point for an incision of the tissue to obtain access to the tooth with the instruments to be used for its extraction, with the object of causing a minimum amount of trauma and conserving as much as possible of the gum tissue, so that on completion of the operation the gum tissue will protect the socket and the second molar.

The radiogram should be used in conjunction with the clinical examination for the purpose of determining better the point of incision. When the operator has decided the character of the incision that is to be made, which is governed by the type of impaction presented, he should take into consideration the tissues on the buccal and lingual surfaces of the second molar, as these tissues should not be disturbed during the extraction of the tooth. There are cases where the incision is made in proximity to the distobuccal surface of the second molar, and in these cases the incision should be made in such manner that the flap can be returned to its original position.

The clinical examination should also determine the character of the preliminary preparation of the operating field and include the removal of any débris that may be found under the gum tissue folds.

During the examination attention should be given to the possible presence of infection of the gum tissue, which is usually due to the packing of food débris under the flap where the latter covers a part of the occlusal surface or may be due to débris entering the space between the crowns of the second and third molars where the third molar is at an angle or in a horizontal position. An infection of the gum tissue usually indicates the presence of a pathologic condition of the ossi- structure.

Examination of Interproximal Space.—A careful clinical examination of the approximately normal or abnormal interproximal space between the second and third molars should be made where possible, so that the operator may determine, in advance of any operative procedure, the size of the space available for the application of the blade of the exolever to the mesial or mesiobuccal surface of the third molar, and may also decide the fulcrum. This examination is, however, practicable only where a part of the occlusal surface is exposed, or where the tooth is at an angle or in a horizontal position, and parts of the occlusal and distal surfaces are exposed. No great dependence can be placed on the clinical examination of the interproximal space in a

case where a part of the crown is below the superior border of the ossistructure, but in the case of an exposed crown, where its mesial surface is accessible, such examination may be sufficient. A radiogram will, however, give the operator a better means of ascertaining the exact size of the interproximal space, so that he can determine the size of the exolever blade that is to be applied to the mesial surface. The initial introduction of the exolever blade into the interproximal space and the subsequent turning of the handle of the instrument to direct the tooth distally will increase the size of the space, and the operator should be prepared, as the larger blades are used, to utilize any available fulcrum, as the farther the tooth is directed distally from its original position, the larger will become the space; and the larger the space becomes, the larger will be the exolever blade that will be indicated.

Examination of Second Molar.—In the case of an impacted mandibular third molar the second molar should be carefully examined for the purpose of determining whether it is in alignment with the crowns of the first and third molars. Where the second molar is deflected out of alignment buccally with the first molar, such condition will be shown in the radiogram by an overlap of the crown of the first molar upon the second. Where the second molar is deflected lingually, the radiogram will show the deflection by a part of the occlusal surface being visible, whereas if it were in alignment, no part of the occlusal surface will be shown and there will be a definite enamel cap. Where the contact point between the first and second molars is examined for the purpose of determining whether the radiogram has been correctly made, it is very important for the operator, when making the clinical examination, to observe whether the first and second molars are in alignment, and, if not, the radiogram will show the character of the deflection, a condition that should be taken into consideration when making an interpretation of the radiogram of an impacted third molar.

The degree of firmness with which the second molar is attached to the supporting structure should be established, and this point can be determined with the probe, or the tooth may be taken between the thumb and index finger and tested as to its firmness. If the tooth is not firmly attached to the supporting structure, it will not serve as a fulcrum for the exolever technic in cases where such a procedure is indicated.

In addition to giving consideration to the foregoing phases connected with the second molar, the operator should determine whether the tooth has a gold crown attached, whether it has a filling and whether caries has involved any of its surfaces. Especially should the distal surface be examined, as the exolever technic in some types of

cases engages that surface, and its strength for such technic should be determined. Any overhanging fillings or misfitting crowns are easily displaced where there is a close contact of these fillings and crowns with the impacted mandibular third molar. Where either of these conditions prevails, the operator should advise the patient in advance of the possibility of a displacement of the artificial part, or he may be held responsible if it is disturbed during the operative procedure.

Where the clinical examination indicates that an unusual amount of resistance may be encountered in the extraction of the third molar, a radiogram should be made to determine the degree of dependence that may be placed on the second molar as a fulcrum. It should be remembered that, where there is a fusion of the roots of the second molar, the tooth cannot be used as a fulcrum to the same extent as where the roots are markedly separated and there is a heavy septum between the roots, but the presence of such a condition can be determined only by a radiogram.

Gold Crown or Bridge Attached to Second Molar.—Where a gold crown is attached to the second molar, very little dependence can be placed on the clinical examination, except to determine the distance to which the crown extends on the buccal, lingual and distal surfaces, and to note the extent of the impingement of the crown of the third molar upon the artificial crown of the second. In such cases it is very important to ascertain the relationship between the artificial crown of the second molar and the crown of the third, and the only reliable method for obtaining this information is to make a radiogram of the prevailing condition.

Involvement of Pulp of Second Molar.—The pressure of the crown of the impacted mandibular third molar, when in an angular or a horizontal position, against the distal surface of the crown or root of the second molar will often involve the pulp of the latter tooth. Testing the second molar for vitality should be a routine procedure before every operation, and the existing condition should be checked with the radiographic findings. If this procedure is not followed, it will be embarrassing to the operator to find, after he has extracted the impacted molar at a later date, that the second molar was the factor which produced the main symptoms indicating the disturbance.

Second Molar Present and First Molar Missing.—A careful clinical examination of the second molar should be made in a case in which the first molar is missing. Often, where the impacted third molar is to be extracted, the second molar is used as a fulcrum to aid in the extraction; but, in order that the second molar may be used advantageously as a fulcrum, the first molar should be present to stabilize the second.

If the first molar is missing, the operator cannot use the second as a fulcrum as freely as if the first molar were in position, and especially is this the case where the first molar has been only recently extracted, or where the first molar is missing and the second molar roots are fused. In this class of cases there is a liability of loosening the second molar unless that tooth is reinforced, and this liability will be increased if the tooth is to be used as a fulcrum.

If the second molar is not firmly attached to the supporting structure, or has a gold crown attached, or there is a large amalgam filling or gold inlay in the tooth, or the roots are fused, that tooth cannot be used as a fulcrum, and the ossistructure may be utilized as a fulcrum in order to apply such exolever technic as is necessary to extract the impacted tooth.

In the conditions described special precaution should be taken, while extracting the third molar, not to disturb the second, especially if the pulp of that tooth is not involved and it is in other respects in a normal state. If the necessary precaution is taken, no accident is liable to occur.

Isolated Impacted Mandibular Third Molar.—An isolated impacted mandibular third molar is one where the second molar has been extracted. A fistulous opening or an infected area of gum tissue in the region of the third molar or an exposed part of the crown is the usual clinical evidence of an isolated impacted mandibular third molar. Where such evidence is presented, a radiogram should be made for diagnostic and operative purposes, as a clinical examination is not sufficient in the case where the tooth is located below the superior border of the ossistructure. If it is not convenient to make a radiogram of the case, the exposed part of the crown should be examined to determine, if practicable, the position of the tooth. Where the tooth is in a vertical or an angular position the buccal surface is examined to locate, if possible, the bifurcation, and also to determine whether access with the blade of the exolever can be obtained on the buccal surface. The mesial surface is also examined, where possible, to determine whether immediate access to that surface can be obtained with the exolever, or whether it will be necessary to excise the ossistructure in that region in order to apply the exolever to the mesial surface.

Examination of Roots.—In the case of the extraction of an impacted tooth, where the roots remain and are exposed, the probe should be employed to make the clinical examination in an effort to determine to what extent the roots are attached to the supporting ossistructure and to learn the condition of all the surfaces that can be reached with the instrument. If, however, a definite examination cannot be made by this method, recourse should be had to a radiogram for the purpose of

enabling the operator to make a correct diagnosis, and especially should this procedure be followed where there has been a previous attempt at extraction. This procedure may require a little more time, but it will be more satisfactory than to be in doubt, for this may cause unnecessary mutilation of the supporting structure, probably produce a fracture of the parts and further complicate the extraction of the roots.

Mandibular Third Molar on Opposite Side.—In the case of an impacted mandibular third molar, a clinical examination should be made for possible infection around the corresponding molar on the opposite side of the mouth, as frequently both sides are involved. Sometimes the examination will disclose the opposite molar to be also impacted and occupying the same relative position as the tooth to be extracted.

Maxillary Third Molar.—The maxillary third molar over an impacted mandibular third molar should be examined clinically for infection or other condition before any operative procedure is begun on the impacted mandibular third molar. Infection around the maxillary molar, if it exists, should be remedied, as this area may infect the socket of the mandibular third molar after the latter tooth has been extracted; or a maxillary third molar may be so elongated as to create a pressure on the gum tissue over the impacted tooth and cause an irritation. In many cases of this character it is advisable to extract the maxillary molar, when involved, before operating on the impacted mandibular third molar.

Attempted Extraction on Impacted Mandibular Third Molar.—Where another operator has attempted the extraction of an impacted mandibular third molar, a clinical examination of the result of the previous operation should be made to determine whether any trauma of the gum tissue around the third and second molars has occurred, or whether a part of the crown has been fractured away, and also to ascertain the cause of the failure in the extraction, which in the majority of cases is due to an attempted operation with forceps. Where probably an "elevator" has been used without regard to the deflection of the crown, especially where the third molar is deflected buccally or buccolingually out of alignment with the distobuccal surface of the crown of the second molar, an effort should be made to ascertain by a clinical examination whether the deflection has been the cause of the failure to extract the tooth, and in all such cases the second molar should be examined to determine whether an injury occurred to that tooth. A radiogram of the case will always indicate more clearly the cause of the failure in extraction, and under "Attempted Extraction" (page 94) radiograms of such cases are illustrated.

Internal and External Oblique Ridges.—When making a clinical ex-

amination, the internal and external oblique ridges should be located by a digital examination, and the results of this examination should be compared with the position of the tooth as may be revealed by any exposed part of the crown, should there be such an exposure, or as may be revealed by a digital examination of the area over the impacted tooth. These examinations should be made conjointly when determining in a radiogram the location of the ossistructure on the distal surface.

Size of Oral Cavity.—The size of the oral cavity should be observed when making a clinical examination to determine the access to the region of the impacted tooth. The size of the oral cavity varies in different persons, and a large mouth permits easy access, while a small one is difficult of access. A study of the size of the oral cavity, together with the design of the shank of the instrument to be employed, should be made in order to avoid any injury to the lips or the corners of the mouth.

General Oral Conditions.—After the operator has made a survey of the impacted tooth and its surrounding structure, he should carefully examine the patient's mouth for the purpose of determining whether there are any infected teeth more extensively involved than the impacted tooth to be extracted, as it may be necessary to correct some prevailing infection before proceeding with the extraction. It is important that the mouth be in a hygienic condition at the time of the operation, so that the most favorable postoperative results may be attained.

The condition of the glands and tonsils should receive special attention, as they are frequently involved, and examination should be made for the possible presence of trismus or false ankylosis. Where either condition prevails, the affection should be corrected, if possible, in advance of any operative procedure.

General Condition of Patient.—The operator should, before undertaking the extraction of an impacted mandibular third molar, note the physical condition of the patient to determine if he is physically fit to have the operation performed. Where the operator is in doubt on this point, he should make an examination of the general physical condition of the patient, including tests of blood pressure, urine, blood count, respiration, and such other tests as may be deemed necessary, in order to determine the ability of the patient to undergo the operation. In addition to these observations, the age of the patient is an important factor in connection with the character of the operation and the anesthetic to be employed. If, in the judgment of the operator, the physical condition of the patient indicates a consultation with the family physician, the operation should be postponed until after such consultation can be had.

History of Case.—It is very important that as complete a history

as possible of a case should be obtained, as in many instances the patient has experienced previous discomfort and pain. If there has been previous pain, its nature should, if possible, be ascertained; if there has been any involvement of other parts, such as glands or tonsils, the character of the affection should be learned; if there is a history of hemophilia, the degree of such condition should be determined, and inquiry should also be made as to whether there has been any previous attempt to extract the tooth. Where the history discloses a previous infection around the impacted tooth, the ossistructure and peridental membrane usually present a pathologic condition, and in such a case less resistance may be expected during extraction than when the condition is normal.

Radiogram Following Clinical Diagnosis.—The clinical diagnosis having been completed, the operator should have a radiogram made of the impacted tooth in order that he may confirm his clinical findings and obtain any additional data concerning the tooth and ossistructure that may be available.

CHAPTER III

Radiographic Technic

So much depends on a correct diagnosis of the position of the impacted mandibular third molar, the character of its root formation, the nature of its surrounding ossistructure and the condition of the second molar as a guide for the operator in the operative procedure that it is essential that a radiogram be made of every case of impaction presented, whether it be a simple or complicated character. This procedure should be followed in order that the operator may have a correctly made picture of the impacted tooth, the surrounding ossistructure and the second molar, delineating as clearly as possible all the details that may be obtainable. Such a picture, combined with a definite operative procedure, will be an important factor in reducing the time required for the operation, in lessening the accompanying trauma, in decreasing the postoperative pain and in insuring a satisfactory result that will be pleasing to the patient and gratifying to the operator. In order to obtain such a picture, the operator should have a thorough knowledge of radiographic technic pertaining to the region of the mandibular third molar.

The radiographic technic should be of a standardized character, with the radiograms of the various cases made in a uniform manner, so that any feature indicating a deviation from a normal condition may be immediately detected. The technic described has proved very satisfactory for obtaining practical results.

METHODS OF MAKING RADIOGRAMS

There are two methods of making radiograms of the mandibular third molar region—intra-oral and extra-oral. The intra-oral method, where the small dental film is placed inside of the mouth, is the usual procedure, and with it more detail is obtainable and less distortion is shown than with the extra-oral method. Where the extra-oral method is employed, a large plate or film is placed outside of the mouth. This procedure is followed only in cases where, for some physical reason, the small film cannot be introduced into the mouth. The intra-oral method is far more satisfactory as a guide for operative procedure, and, while the introduction of the film into the mouth may sometimes be perplexing to the operator and annoying to the patient, the technic will be found to be simple. The extra-oral technic is more readily applied, but is not so well adapted for diagnostic purposes as the intra-oral method.

INTRA-ORAL RADIOGRAM

Description of Intra-oral Film.—While the different styles of films for intra-oral exposure may vary slightly in size, they are about 1¾ inches long by 1¼ inches wide, including the paper or metal protector for the back. Some films are protected with a paper and others with a metal back.

Position of Patient.—The usual style of dental chair is the most satisfactory for seating the patient. It is, however, advisable to remove the footrest, as the patient may then place his feet solidly on the floor near the base of the chair, and this will at the same time allow the operator to have free movement in front of the patient. The patient assumes an upright sitting position, with the jaw containing the affected tooth at a right angle to the cone of the x-ray apparatus, and the head firmly placed in the headrest in such a position that, when the jaws are fully opened, the mandibular teeth will be on a horizontal

Fig. 1.—Inserting Intra-oral Film—Lingual Radiogram. Position of operator's hands; retracting cheek with left forefinger, using right forefinger and thumb in introducing film.

Fig. 2.—Inserting Intra-oral Film—Lingual Radiogram. Position of operator's hands; placing film in postiion with right forefinger, using left forefinger as a guide.

plane, the chin being neither dropped down nor tilted upward. In this position the film will be more easily placed than if the jaw were at an angle. The patient is made to feel at ease, as some patients are nervous at the time and apprehensive of the effect on themselves of the electrical demonstration that is to ensue. The light should be so arranged as to enable the operator to have a full view of the oral cavity.

In the illustrations used in the description of the film technic the demonstration is shown as being on the right side of the mouth of the patient. A demonstration on the left side of the mouth will require a change in the application of the fingers of the operator and patient respectively.

Inserting Intra-oral Film.—The operator makes an examination of the oral cavity to determine, at least approximately, the position of

the tooth of which a radiogram is to be made, noting any difficulty the patient may have in opening the mouth, which will serve as a guide in placing the film. It should always be the aim of the operator to have the radiogram show the apices of the tooth, for the radiogram will not be satisfactory unless these parts of the tooth are shown, as a knowledge of the direction of the roots is an important factor in the operative procedure. The side of the film should be at a right angle to the target rays, and any bending of the film should, if possible, be avoided.

The operator assumes a position in front of the patient, inserts the left forefinger into the mouth and draws the cheek aside in order to expose to view the third molar area, and with the right thumb and forefinger places the film, with the emulsion side toward the lingual surface of the tooth, or its enveloping tissue, into the first position,

Fig. 3.—Inserting Intra-oral Film—Lingual Radiogram. Position of operator's hands; holding film in place with left and right forefingers respectively, while patient places his left forefinger in center of film against crown of second molar.

Fig. 4.—Inserting Intra-oral Film—Lingual Radiogram. Position of operator's left hand and patient's left forefinger holding film in place as shown in Fig. 2, patient using cheek as a brace, with right hand of operator eliminated.

holding the film against the lingual surface with the right forefinger (Fig. 1).

After the film is in this position, the left forefinger is moved over the top and slightly on the back of the film to hold it in place and prevent it from being forced upward by the muscles of the jaw (Fig. 2).

The right forefinger is now moved from the back of the film toward the front to allow the patient to place his left forefinger against the film, taking the place occupied by the right forefinger of the operator (Fig. 3).

The patient's forefinger will be about in the center of the film at the crown of the second molar, so that, when the pressure of the finger is applied to hold the film firmly in place, the top of the film will not be bent buccally, but will remain rigidly in position. If the forefinger is placed farther anteriorly than the center of the film, the distal

end will drop down, owing to the tendency of the patient to close the mouth, and a radiogram of the tooth at a wrong angle will be the result, causing the impacted tooth to appear more deeply seated than is really the case; and if the forefinger is placed farther distally, the anterior end will drop down and a radiogram at a reversed wrong angle will be the result. Sometimes the placing of the film in the position described may cause the patient to gag, which affection will, however, be overcome after a few trials of placing the film. The patient is instructed to retain the position of the finger, not to move any part of the body, and not to swallow during the exposure.

The operator's right hand is then removed, and an observation made to see that the patient is holding the film firmly in position (Fig. 4).

The operator's left hand is now removed, leaving the patient to hold the film firmly against the crown of the second molar, and in this position the exposure is made (Fig. 5).

Fig. 5.—Correct Position of Intra-oral Film—Lingual Radiogram. Position of patient's left forefinger holding film in place as shown in Fig. 2, with cone of x-ray apparatus directed at a right angle to film, ready for exposure.

Fig. 6. — Position of Film—Lingual Radiogram — Vertical or Angular Impaction. Intra-oral film placed for making radiogram of impacted mandibular third molar in vertical or angular position. Anterior border of film in line with mesial surface of first molar, and upper border of film parallel with occlusal surfaces of first and second molars.

Where the third molar is impacted in a vertical or mesioangular position, the film is so placed in the mouth against the tooth that the top part of the protector is about one-fourth of the width of the film above and parallel with the occlusal surface of the normal teeth, care being taken that the film is placed high enough to show a part of the ascending ramus in the radiogram and that the proximal end of the protector is at the mesial surface of the first molar (Fig. 6).

Where the third molar is impacted in a horizontal or distoangular position, the film, in order that the apices of the tooth may show in the radiogram, is placed farther distally, so that the proximal end of the protector is at the center of the first molar (Fig. 7).

Fig. 7. — Position of Film — Lingual Radiogram — Horizontal or Distoangular Impaction. Intra-oral film correctly placed for making radiogram of impacted mandibular third molar in horizontal or distoangular position. Anterior border of film at center of first molar, and upper border of film parallel with occlusal surfaces of first and second molars.

If, after the radiogram has been made, it is found that the film was not properly placed, or that there was a movement of the patient during the exposure, resulting in an unsatisfactory picture, another radiogram must be made, the previous picture being used as a guide for indicated corrections.

In case it is impracticable, on account of excessive swelling in the third molar region or of the presence of false ankylosis, to place the intra-oral film in proper position in the mouth, which condition would interfere with taking a correct lingual radiogram, an extra-oral radiogram should be made. An extra-oral radiogram will not, however, give the minute detail that is possible with a film placed inside of the mouth, and for that reason the extra-oral method is not followed unless conditions make it necessary.

Adjustment of Cone.—The tube of the x-ray apparatus is so adjusted that the mouth of the cone is directly opposite and at a right angle to the affected tooth. The distance between the target and the tooth should be about 18 inches, and the center of the target rays is to be directed on the roots of the tooth. If the target rays do not squarely strike the film at a right angle, the radiogram will be distorted; if the exposure is made at an angle from the front, the radiogram will show the roots elongated and present an overlap at the contact point of the crowns; if made at an acute angle from above, the tooth will appear elongated; and if made at an obtuse angle from below, the tooth will appear foreshortened.

Making Exposure.—The length of exposure will depend on the bone density, amount of swelling, age of patient and type of x-ray apparatus used. The greater the bone density, the more intense the swelling, and the older the patient, the longer should be the exposure. A spark gap of from 3 to 5 inches, running from 20 to 25 milliamperes, with an exposure of from four to six seconds, at a distance of about 18 inches between the target and the tooth, when using an intra-oral film, will prove reasonably correct for the average patient.

Tooth Deflected Lingually.—If, after the radiogram has been made according to the description in connection with Figs. 1 to 7, it is found that the impacted tooth is in a marked lingual position, the root formation will not be shown, and, if the lingual deflection is not very marked, the roots will appear foreshortened. In either case it will be necessary, in order to obtain a correct radiogram of the root formation and determine the direction of the roots, to make another radiogram. This second radiogram should, however, be made with the cone directed at an acute angle from above, as when making a radiogram of a maxillary third molar, except that the film is held in the same position as where the cone is directed at a right angle to the tooth,

Fig. 8. — Position of Cone and Film — Lingual Radiogram — Lingual Deflection. Position of patient's left forefinger holding film in place as shown in Fig. 5, with cone of x-ray apparatus directed at an angle of approximately 45° to film, an angle indicated in a lingual deflection in order to obtain a correct definition of root formation.

the only change being the angle at which the cone is placed, when the radiogram will clearly show the root formation (Fig. 8).

Developing Intra-oral Film.—A development of from five to six minutes at a temperature of from 65 to 68 degrees Fahrenheit will give satisfactory results with any good standard x-ray developer, but developers intended for photographic purposes should not be used. Development is continued until the film, when held to the red light, will show only a slight trace of the tooth (not considering gold crown or fillings), after which the film is thoroughly rinsed and placed in a fixing bath for about ten minutes. If the radiogram is too dense, the exposure was probably too long; if it is transparent and shows a lack of detail, there was probably underexposure. Correct exposure and proper development are necessary in order to obtain good results

OCCLUSAL RADIOGRAM

In addition to the usual intra-oral method of making a lingual radiogram, where the small dental film is placed in the mouth against the lingual surface of the impacted tooth, the same kind of film is often used advantageously to make an occlusal radiogram.

Position of Patient.—When making an occlusal radiogram the headrest of the dental chair is lowered and turned to the left or right side, as the case may require. The patient assumes an upright sitting position, as when a lingual radiogram is being made, but the head is tilted either to the right or left side, as the case may require, with the side of the mandible containing the affected tooth turned upward and elevated as far as possible.

Inserting Intra-oral Film.—The film is placed flat upon the occlusal surface of the third molar, with the emulsion side down and with the

Fig. 9.—Occlusal Radiogram. Position of patient's left forefinger holding film in place as shown in Fig. 10, with cone of x-ray apparatus directed upward at an obtuse angle, which is indicated in making an occlusal radiogram in order to obtain a correct definition of any deflection of mandibular third molar.

Fig. 10.—Occlusal Radiogram. Mandible used to show relative positions of film, patient's finger and proper cone adjustment for occlusal radiogram.

proximal end of the protector at the center of the first molar. The patient places the index finger of his right or left hand, as the case may require, upon the film directly over the crown of the second molar (Fig. 9).

In order that the relative positions of the film, the patient's finger and the cone may be readily understood, an illustration, in which a dry mandible is used, is shown that presents a comprehensive view of these positions (Fig. 10).

Adjustment of Cone.—The tube is lowered and the cone is directed upward at an obtuse angle, as closely as the case will permit, toward the inferior border of the mandible. The cone is then adjusted so that the target rays will pass in a straight line through the inferior border of the mandible to the crown of the impacted tooth and will cast a perfect shadow of the crown upon the radiogram, but will not show any part of the roots of the first and second molars, as they will be

superimposed upon the crown if the radiogram is correctly made (Figs. 9 and 10).

If the cone is not adjusted in such position that the rays will pass in a straight line with the long axis of the tooth, there will appear an overlapping of the crowns of the second and third molars, and a shadow of the roots of the third molar will be produced.

Making Exposure.—The occlusal radiogram requires a greater degree of penetration and consequently a much longer exposure than the average lingual radiogram. When working with a 5-inch spark gap at from 20 to 25 milliamperes and using a regular film, the time of exposure should be at least from seven to eight seconds. A speed film may be used, which will decrease the time of exposure, but with such a film a great deal of detail will be lost compared with what can be obtained with the regular film.

The cone usually used with a dental x-ray apparatus is not suitable for making an occlusal radiogram, as its length is not sufficient to permit a proper adjustment at the necessary angle. The best results are obtained with a cone about 20 inches in length and 2½ inches in diameter.

The occlusal radiogram will show approximately the degree of buccal or lingual deflection of the third molar that may be present compared with the position of the second molar, and will indicate the amount of ossistructure on the buccal surface that may be available as a fulcrum in the operative procedure. The radiogram will not, however, show the point of contact of the occlusal or mesial surface of the third molar with the distal surface of the crown or root of the second molar, nor will it show the size of the interproximal space between these two teeth, as this space will be obliterated and the character of the root formation will not be discernible.

An occlusal radiogram is of considerable service in all types of impaction, but it is especially valuable in the case in which the third molar is impacted in a mesioangular or horizontal position, and also when it is deflected in an extremely lingual or buccal position.

EXTRA-ORAL RADIOGRAM

The extra-oral radiogram is employed where trismus or swelling will not allow the placing of an intra-oral film into the oral cavity, or where the representation of a large area is to be obtained. In the extra-oral method a large plate or film is placed on the outside of the jaw, and the area of which a radiogram is desired is brought in close contact with the plate or film. Although a larger radiogram can be made by the extra-oral method, less detail is obtained.

The technic for making an extra-oral radiogram is simple when once

mastered, but should be carefully followed if any dependence for diagnosis is to be placed on the results.

Position of Patient.—While the usual method of making an extra-oral radiogram is for the patient to lie on a table, or to be seated on a chair with the head placed on a table or to employ an attachment to the tubestand for this purpose, the same effect can be accomplished with the use of a dental chair. Where this is used, one of the arms of the chair is lowered and the patient is seated sidewise.

The back of the chair is adjusted in a vertical position, with the headrest pads arranged at an angle so that they will present a flat surface upon which the plate or film can be placed. The jaw containing the affected tooth is placed firmly against the plate or film, with the emulsion side against the jaw.

In making a radiogram of the third molar region by the extra-oral method, a correct shadow representation of the affected area, free from the shadows of the opposite side, should be obtained, and this is done by directing the target rays in such a way that they will cast a shadow of the area desired.

The position in which the patient's jaw is placed against the plate or film is an important matter to be observed. The spine and the ascending ramus of the mandible on the side of the head opposite the area of which a radiogram is to be made are the two important anatomic points to be taken into consideration, and the target rays should be made to pass between this ascending ramus and the spine at such an angle as to cast a direct shadow length of the teeth upon the plate. If this method is not correctly followed, the shadow of the parts opposite the affected region will be superimposed upon the shadow of the desired area.

Making Exposure.—When the operator is ready to make the exposure for an extra-oral radiogram, the tube is so adjusted that the target, or anode, is about 14 inches from the plate, and the center of the target rays is directed on the roots of the tooth to be extracted. The patient should be instructed to keep the mouth closed and the teeth together in their natural occlusion. The length of exposure will depend entirely on the type and power of the apparatus used and the speed of the plate or film. It should be borne in mind that there are many anatomic variations in the dental and oral structures of different persons, making it necessary to vary the technic to conform to the conditions presented.

A more detailed account of making an extra-oral radiogram may be obtained from any standard book on dental radiography.

In making allowance for any advantages that may be connected with other methods of making radiograms, it has been found that the

method described for making the intra-oral radiogram, including the occlusal radiogram, is the simplest and most dependable.

IMPORTANCE OF A CORRECT RADIOGRAM

Radiogram as Definite Guide.—The radiogram, when correctly made and properly developed, will be a definite guide for the operative procedure. Patients often present radiograms of impacted mandibular third molars that have been incorrectly made, and expect the operator to make his diagnosis from such pictures. Where the operator cannot depend on the picture presented by the patient, a radiogram with more definite detail should be made.

CHAPTER IV

Correct and Incorrect Radiograms

TO make a radiogram of an impacted mandibular third molar without following a definite technic will, aside from giving the approximate location and position of the tooth, prove unsatisfactory for the purpose of obtaining a correct interpretation as a guide for the operative procedure.

In order to determine whether there is any deviation from an approximately normal condition, the operator, having fixed in his mind from the clinical examination the sizes of the crowns of the first, second and third molars, makes a comparative study of their sizes in the radiogram. The sizes of the various crowns as they appear in the radiogram should be identical with the respective sizes of the clinical estimate, and, if the two sizes do not correspond, the radiogram has been incorrectly made.

Contact Point.—A clinical examination of the contact points will be the quickest method of determining whether the radiogram has been correctly made (Fig. 11). A radiogram should always show the teeth in the same position in which they are found in a clinical examination, and an interpretation of the radiogram will reveal whether there is an approximately normal contact of the distal surface of the first molar with the mesial surface of the second. In Fig. 11 A, which is an occlusal illustration, is represented what is seen in the clinical examination of a first, second and third molar; and Fig. 11 B, which is an illustration of a lingual radiogram, must correspond with Fig. 11 A as to contact points. Where a clinical examination does not disclose a deflection of the first or second molar and the teeth are in approximately normal positions, but the radiogram shows an overlap of either tooth upon the other (Fig. 11 C), the radiogram will have been in all probability incorrectly made and should be made over. The first and second molars, when the contour of the crowns is not lost because of large fillings, are the most dependable teeth for furnishing the important diagnostic points of contact. Where a clinical examination discloses a lingual deflection of the first or second molar, there may or may not be an overlap at the contact point of these two teeth, and this condition will be shown by a correctly made radiogram.

Lingual Deflection of Second Molar.—In Fig. 12 is shown an illustration of an occlusal view, also an illustration of a radiogram showing the lingual deflection of the second molar. In Fig. 12 A, which is an occlusal illustration, the second molar is deflected lingually, but there

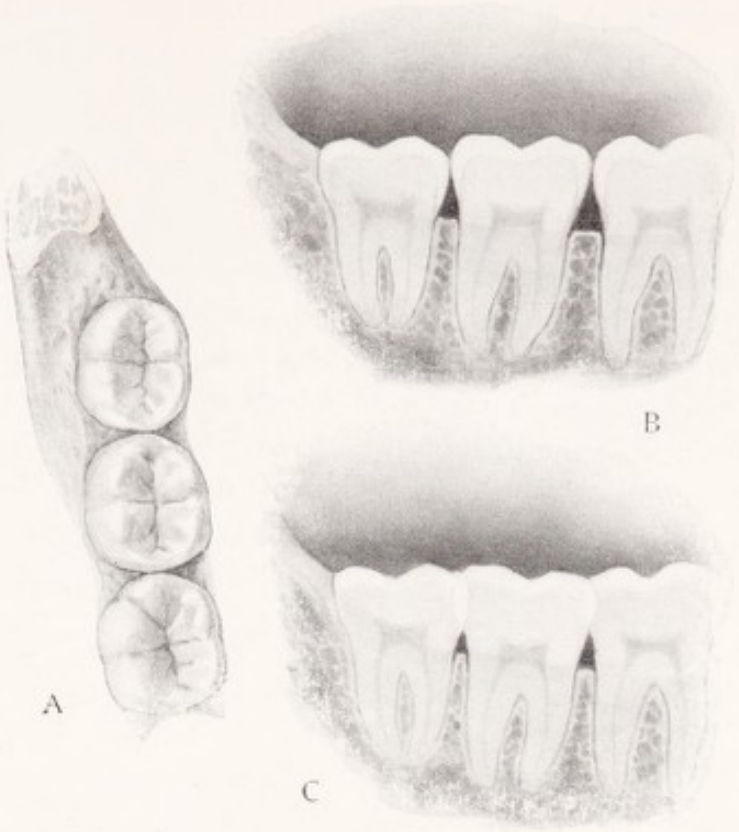


Fig. 11.—Approximately Normal Contact. *A*, occlusal illustration of an approximately normal contact of first, second and third molars; *B*, illustration of a lingual radiogram, which checks condition; *C*, illustration of a radiogram incorrectly made, which shows overlap of contact points.

is no overlap of the mesial surface of the third molar upon the distal surface of the second, as the third molar is not deflected lingually. In Fig. 12 B, which is an illustration of a lingual radiogram, the condition is checked by showing a lingual deflection of the second molar, as a part of the occlusal surface is presented to view, while the first and third molars show no part of their occlusal surfaces.

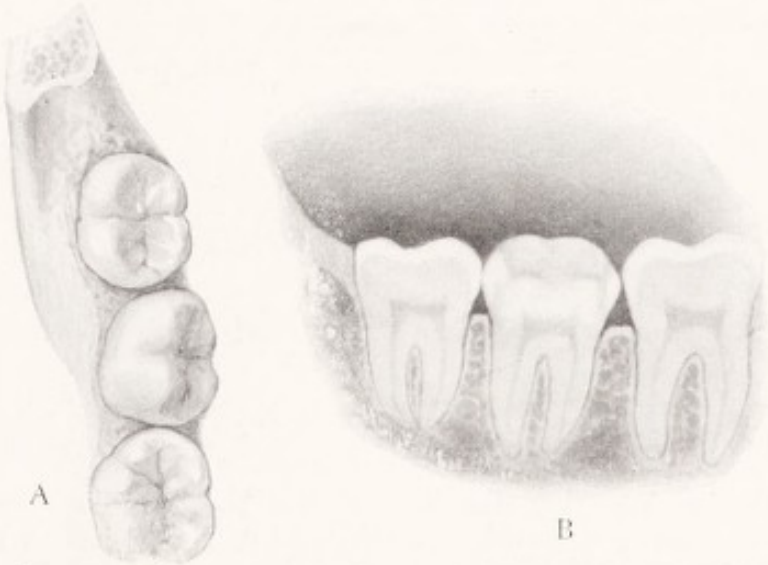


Fig. 12.—Lingual Deflection of Second Molar. *A*, occlusal illustration, with second molar deflected decidedly lingually; *B*, illustration of a radiogram, showing lingual deflection of second molar.

Lingual Deflection of Second and Third Molars.—In Fig. 13 is shown an illustration of an occlusal view, also an illustration of a radiogram, showing the lingual deflection of the second and third molars with an overlap at the contact point.

In Fig. 13 A, where both second and third molars are deflected toward the lingual, not only the lingual deflection of both teeth will be shown in the radiogram, but also an overlap of the contact point of the second molar upon the third, as shown in Fig. 13 B.

The foregoing explanation of the difference between the findings of a clinical examination and a radiogram of the same case will also apply to any buccal deflection of the crown of the third molar with the crown of the second. Where there is no lingual deflection or overlap of the second molar upon the first, and there is an overlap of the third molar upon the second, the third molar will invariably be deflected

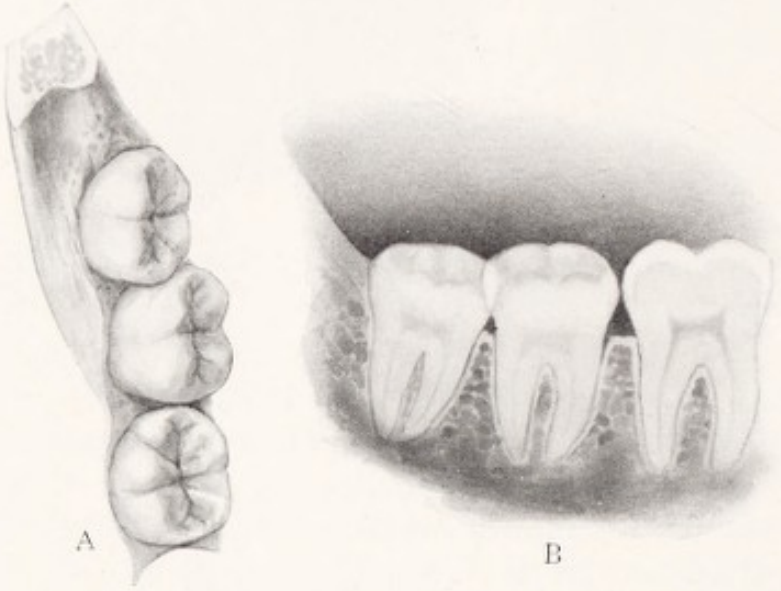


Fig. 13.—Lingual Deflection of Second and Third Molars. *A*, occlusal illustration of an approximately normal first molar, with second and third molars deflected lingually, causing a buccal overlap; *B*, illustration of a lingual radiogram, which checks condition in *A*.

buccally out of alignment with the arch to one of the various degrees to which it is susceptible compared with the buccal surface of the crown of the second molar. The overlapping of the contact point, when present, is a very important factor in the diagnosis for the operation that is to follow, and the radiogram should always present a correct condition of the case.

Buccal Deflection of Third Molar.—In Fig. 14 is shown an illustration of an occlusal view, and also an illustration of a lingual radiogram, showing a buccal deflection of the third molar which produces an overlap upon the second. In Fig. 14 A the third molar is shown buccally deflected. This buccal deflection causes an overlap upon the second molar, which is shown in Fig. 14 B.

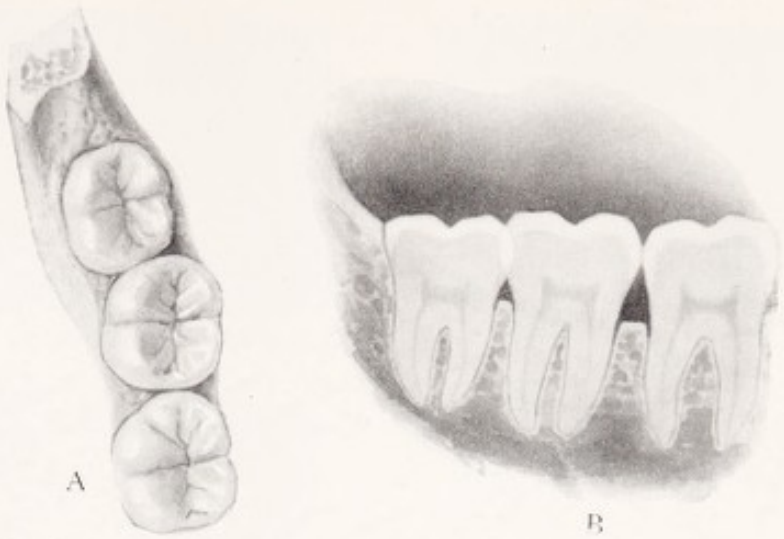


Fig. 14.—Buccal Deflection of Third Molar. *A*, occlusal illustration, with a buccal deflection of third molar; B, illustration of a lingual radiogram, which checks deflection.

Enamel Cap.—In Fig. 15 are shown two illustrations of radiograms showing the difference between an approximately normal enamel cap and a lingual deflection of the third molar.

Where the teeth are in approximately normal alignment the enamel caps of the three molars should have practically the same formation (Fig. 15 A), but, if the enamel caps of only the first and second molars are similar in appearance, a deflection of the third molar may be present (Fig. 15 B).

Pulp Chamber.—In Fig. 16 are shown two illustrations of radiograms, showing the difference between an approximately normal pulp chamber and a torsional deflection of the third molar.

The pulp chambers and canals of the three molars, if in approximately normal alignment, should be similar in appearance (Fig. 16 A). If the pulp chambers and canals of only the first and second molars are similar, the crown of the third molar may be completely deflected

Fig. 15.—Enamel Cap. *A*, illustration of a radiogram of an approximately normal enamel cap of first, second and third molars; *B*, illustration of a radiogram of an approximately normal enamel cap of first and second molars, with loss of enamel cap in third molar due to a lingual deflection.

lingually or torsionally (Fig. 16 B), and this condition is described in Chapter V on "Radiographic Interpretation" (pages 67, 73).

In order to illustrate how to differentiate between a correct and an incorrect radiogram, and how to recognize readily a radiogram that is correctly made, this plan was adopted:

Four dry specimens of mandibles were selected, one mandible with a third molar in an approximately normal position and three mandibles having each an impacted third molar. Eight radiograms were made of each specimen, with the films always in exactly the same position on the lingual side of the mandible, the variations in the radiograms being the result of the different angles at which the cone was placed. The first radiogram of each set of eight pictures shows the radiogram as having been correctly made, and the other seven radiograms show how the third molar may appear distorted by incorrect technic. The

A B

Fig. 16.—Pulp Chamber. *A*, illustration of a radiogram of an approximately normal pulp chamber of first, second and third molars; *B*, illustration of a radiogram of an approximately normal pulp chamber of first and second molars, with lack of definition of pulp chamber in third molar showing only a small spot, due to a torsional deflection.

distortions shown are those usually seen in radiograms where proper attention has not been given to the details that are necessary to present a correct view of the prevailing conditions.

FIRST SPECIMEN

Approximately Normal Third Molar.—In Fig. 17 are shown eight radiograms of an approximately normal third molar, one of the most common types where the tooth is not impacted. It will be observed that of these eight radiograms no two are alike, and yet they are radiograms of the same tooth. In order to present the salient features of the various radiograms, a description of the illustration is given.

Figure 17 A shows a correctly made radiogram of the third molar. There is no deflection of the crown of the tooth, which is free of ossistructure down to the gingival third, and the enamel caps and pulp chambers of the first, second and third molars are uniform in

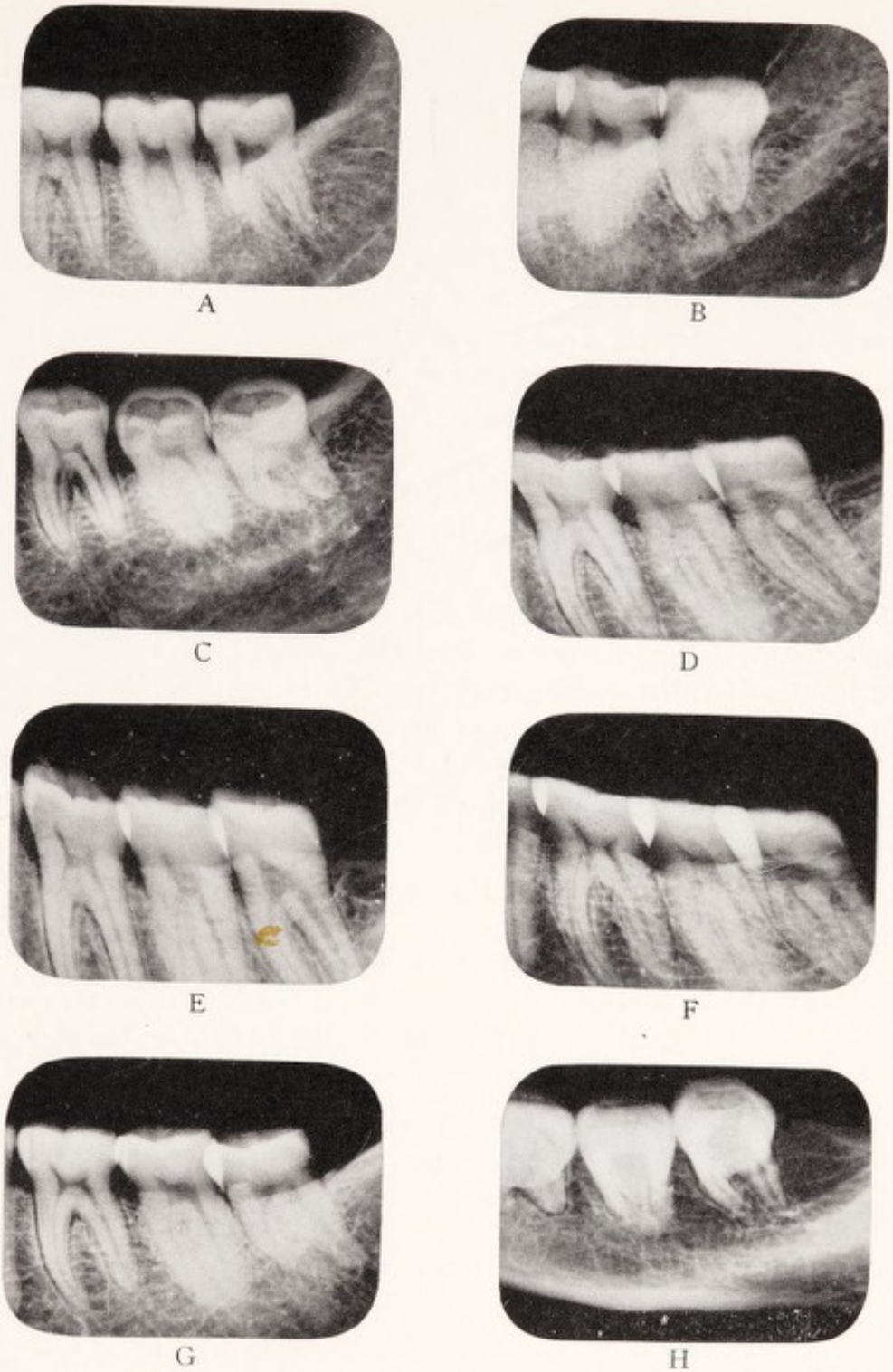


Fig. 17. — Eight Radiograms of an Approximately Normal Mandibular Third Molar. *A*, correctly made radiogram of tooth; the other seven radiograms of same case show different degrees of distortion due to improper angle at which cone was adjusted, film being placed in same position in seven radiograms as in *A*.

appearance. The mesial root is inclined distally and the distal root is straight, with a septum between the roots and a medium-sized interproximal space and interseptum between the second and third molars. There is a normal contact of the mesial surface of the crown of the third molar with the distal surface of the second.

In Fig. 17 B the third molar, compared with the second, is not of a normal size. The enamel cap is indefinite and the pulp chamber is indistinct. The ossistructure on the distal surface extends up to the occlusal surface, and the roots are foreshortened. The contact points between the first, second and third molars overlap.

In Fig. 17 C the occlusal surfaces of the first, second and third molars are shown, and, unless these three surfaces are found to be inclined lingually or buccally in the clinical examination, the radiogram will be incorrect. There is an obliteration of the pulp chamber of the third molar, a foreshortening of its roots, an overlap of the mesial surface of its crown upon the distal surface of the second molar and a foreshortening of the second and third molars. The enamel caps of the second and third molars are indistinct, but the enamel cap of the first molar is fairly distinct.

In Fig. 17 D the first, second and third molars are elongated, and the enamel caps of these three teeth are distinct. The pulp chambers are also distinct, but distorted, and the contact points between the first, second and third molars overlap. The interseptum between the second and third molars is almost obliterated.

Figure 17 E shows practically the same condition as is presented in Fig. 17 D, with the exception of the root ends of the first, second and third molars not being visible, and the occlusal surface of the third molar extending beyond the occlusal surfaces of the first and second molars.

In Fig. 17 F there appears to be a fusion of the second and third molars. The pulp chambers of these two teeth are very indistinct, and there is a marked overlap of the third molar upon the second at the contact point.

In Fig. 17 G the alignment of the occlusal surface of the third molar is below the alignment of the corresponding surface of the second molar, and there is a marked overlap of the crown of the third molar upon the crown of the second.

Figure 17 H shows how a foreshortening is presented. The roots of the third molar are comparatively short, but are still visible, and no definition of the ossistructure, the contact point or the septum can be obtained. The roots of the first and second molars are foreshortened.

SECOND SPECIMEN

Mesioangular Impaction.—In Fig. 18 are shown eight radiograms of a mandibular third molar impacted in a mesioangular position. It will be observed that of these eight radiograms no two are alike, and yet they are radiograms of the same tooth. In order to present

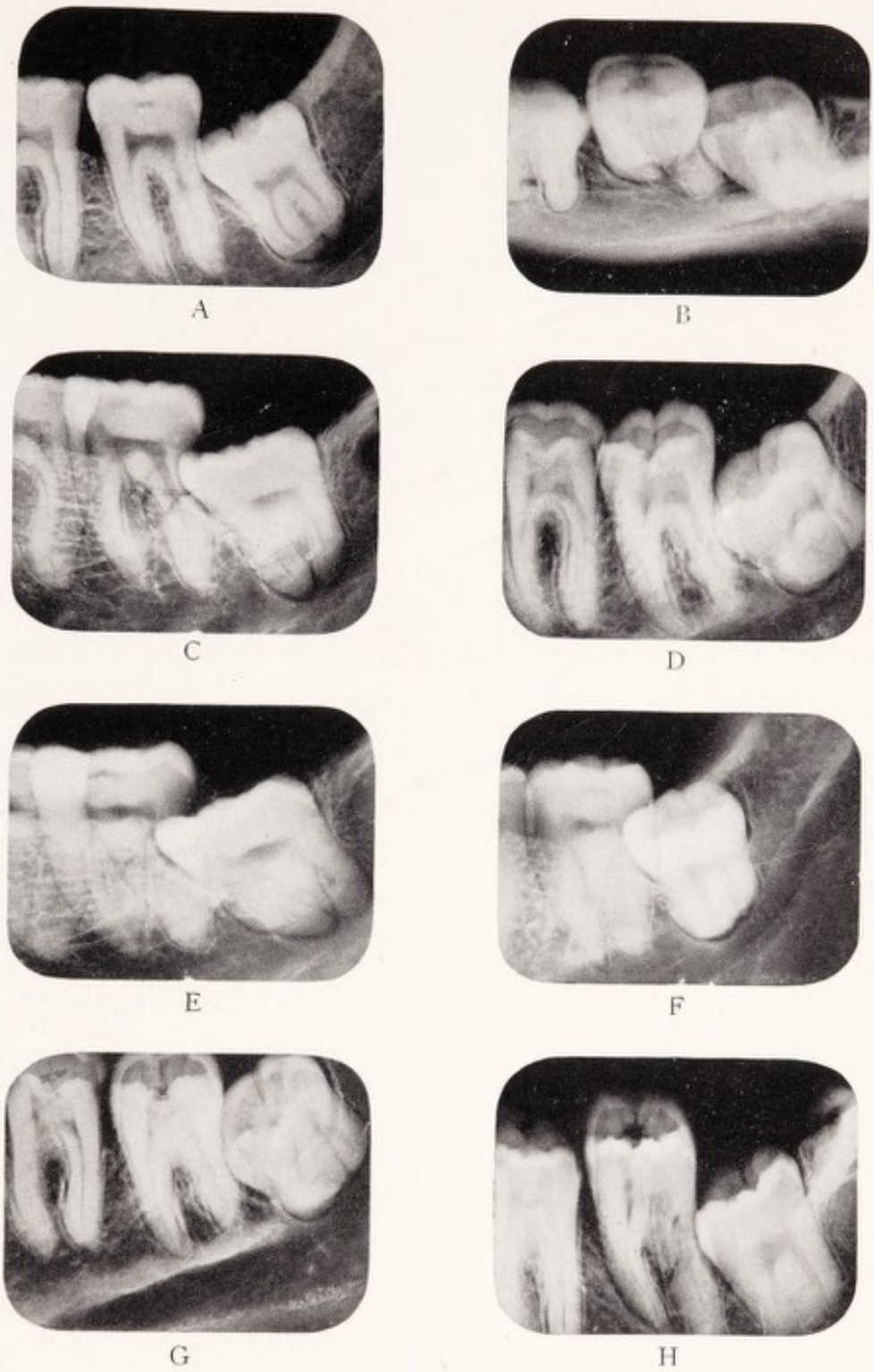


Fig. 18.—Eight Radiograms of a Mandibular Third Molar Impacted in a Mesioangular Position. *A*, correctly made radiogram of tooth; the other seven radiograms of same case show different degrees of distortion due to improper angle at which cone was adjusted, film being placed in same position in seven radiograms as in *A*.

the salient features of the various radiograms, a description of the illustrations is given.

Figure 18 A shows a correctly made radiogram of an impacted third molar, located at an angle to the second molar. The ossistructure on the third molar extends up to the occlusal surface of the tooth, with

the contact point at the gingival third of the second molar, and there is a buccal overlap of the third molar upon the second. There is a contact between the second and third molars, and the pulp chambers and root formations of these two teeth are very distinct.

In Fig. 18 B the ossistructure distal to the third molar is at the gingival third of the tooth instead of extending to the occlusal surface, and the outline of the third molar is completely lost. The crown of the second molar extends above the occlusal surface of the first molar. The roots of the three molars are greatly foreshortened, and their enamel caps and pulp chambers are obliterated.

In Fig. 18 C there is an extreme enlargement of the crown of the first, second and third molars, with extensive overlaps of the third molar upon the second, and of the second molar upon the first. The enamel caps and pulp chambers of these three teeth are distinctly shown.

Figure 18 D shows the occlusal surfaces of the first, second and third molars, with a complete distortion of the third molar and a foreshortening of its roots. The enamel caps of the first and second molars are fairly distinct, but the pulp chambers of the three molars can hardly be seen. The contact point of the third molar with the second is below the gingival third of the latter tooth with an overlap.

In Fig. 18 E the occlusal diameter of the third molar is greater than the length of the tooth. The overlap of the third molar upon the second extends to the pulp chamber of the latter tooth, and the extensive overlap of the second molar upon the first practically obliterates the first molar. The pulp chambers and root formations of the three molars are distorted.

In Fig. 18 F the ossistructure distal to the third molar appears to extend over the occlusal surface of the tooth. The occlusal surface can be clearly seen, and it greatly overlaps the second molar, while its roots are apparently fused and slightly foreshortened. The first and second molars are in normal position, but the outlines of the pulp chamber and roots of the second molar are lost, and there is an overlap of the second molar upon the first. The radiogram was made out of correct position to such an extent that the first molar is almost lost to view.

In Fig. 18 G the first, second and third molars are shown at the upper part of the radiogram, and there is a marked foreshortening of the third molar. The overlap of the third molar upon the second is lost, and the space at the contact point of the first and second molars is greatly increased. The roots of the first and second molars are slightly foreshortened. The occlusal surfaces of the three molars can be seen, but their enamel caps and pulp chambers are obliterated.

In Fig. 18 H very little of the occlusal surfaces of the first and third molars are shown compared with what is to be seen of the occlusal surface of the second molar, which extends above the first and third molars, and the crown of the third molar is nearly normal. The space at the contact point of the first and second molars is increased, and the crowns of these two teeth are elongated. The enamel caps and pulp chambers of the three molars are very indistinct, and the roots of the third molar are distorted.

THIRD SPECIMEN

Mesioangular Impaction.—In Fig. 19 are shown eight radiograms of a mandibular third molar impacted in a mesioangular position. It will be observed that of these eight radiograms no two are alike, and yet they are radiograms of the same tooth. In order to present the salient features of the various radiograms, a description of the illustrations is given.

Figure 19 A shows a correct radiogram of an impacted third molar, located at an angle to the second molar, with the contact slightly below the gingival third of the third molar. Only a small part of the distal surface of the crown of the third molar extends above the superior border of the ossistructure, and there is no overlap of this tooth at its contact with the second molar. The mesial root of the third molar is inclined distally and the distal root is straight, with a medium septum between the roots, and the enamel cap and pulp chamber of the tooth are clearly shown. The first and second molars are of normal size, with a normal contact of these two teeth, and their enamel caps and pulp chambers, together with the interproximal space between the two teeth, are very distinct.

Figure 19 B shows a greatly distorted radiogram, although the film was placed in exactly the same position on the lingual side of the mandible as in Fig. 19 A, but the cone was improperly adjusted. The third molar is located at a different angle, its crown is larger, more of its occlusal surface is visible and the ossistructure on the distal surface extends up to the gingival third of the tooth. The roots appear to be fused, causing a loss of the outline of the septum. The first and second molars are elongated, with a slight lingual inclination of their occlusal surfaces, and the interproximal space between these two teeth is reduced.

Figure 19 C shows an extensive buccal overlap of the third molar upon the second. The occlusal surface of the third molar is directed lingually, and the root formation of the tooth and the distal ossistructure are entirely lost. The occlusal surfaces of the first and second molars are in alignment, and there is an overlap of the second molar

upon the first. The first and second molars are elongated, and there is an enlargement of the crowns, but the outlines of these two teeth and the interproximal space are lost. All definition of the enamel caps and pulp chambers of the three molars is lost.

In Fig. 19 D is shown a decided contrast to the radiogram in Fig. 19 C, as the third molar is greatly shortened instead of being elongated. There is the same lingual inclination of the crown as in Fig. 19 C, with a buccal overlap upon the second molar, but the ossistructure, instead of extending only to the gingival third, extends farther anteriorly, covering the entire crown of the third molar. The second molar has a decided distal inclination, and its pulp chamber and root formation, together with the interproximal space between the first and second molars, are lost. Only a small distal part of the crown of the first molar appears in the radiogram.

In Fig. 19E the third molar is extremely elongated, giving it the appearance of being in a horizontal position, and the roots are not shown. The distal surface of the crown is free of ossistructure, and the space between the occlusal surface of the third molar and the distal surface of the second is greatly increased. The contact of the second and third molars comes to a point, showing a buccal overlap, while in the correct radiogram in Fig. 19 A there is no overlap and the contact is formed with blunt surfaces. The distortion of the first and second molars is much less than that of the third molar. There is a slight overlap of the second molar upon the first, with an enlargement of the crowns, and their enamel caps and pulp chambers, together with the interproximal space between these two teeth, are shown.

In Fig. 19 F the radiogram is of the same character as the one shown in Fig. 19 D, but presents less distortion. The first, second and third molars, and also the distal ossistructure, are shown as being in an anterior position, entirely at variance with the correct position shown in Fig. 19 A. The third molar is shortened, and there is an extensive buccal overlap of this tooth upon the second. There is no lingual inclination of the third molar, and the enamel cap and pulp chamber of this tooth are distinctly seen. The first molar is almost eliminated, and the only part of that tooth remaining is at its contact with the second molar, which tooth shows an overlap.

In Fig. 19 G the first, second and third molars are greatly distorted. The third molar is shortened, but there is an enlargement of the crown, and the details of the root formation are lost. The contact between the second and third molars is located at the apical third of the distal root of the second molar, and there is a decided buccal overlap of the third molar upon the second. Nearly the entire occlusal surfaces of

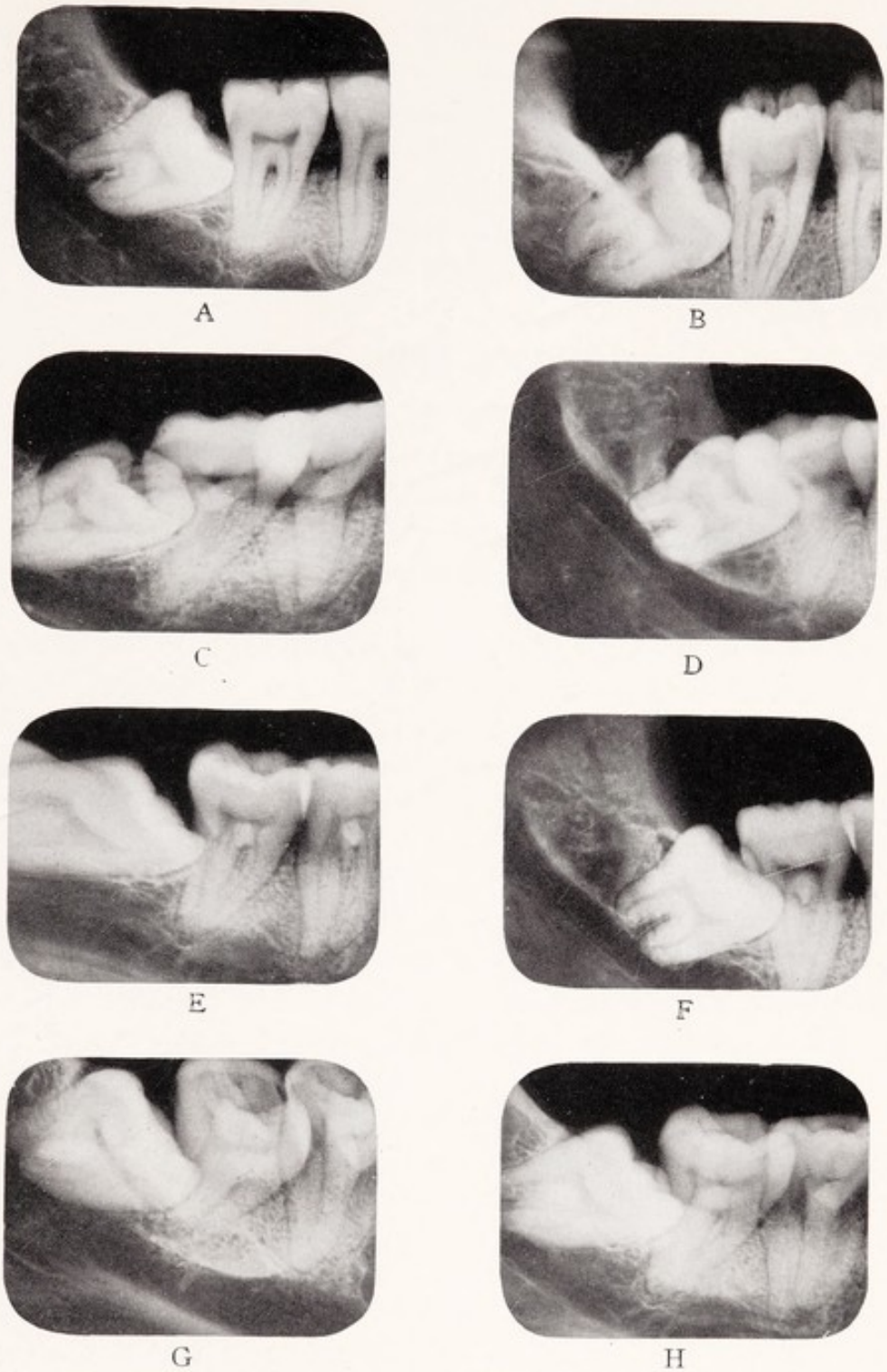


Fig. 19.—Eight Radiograms of a Mandibular Third Molar Impacted in a Mesioangular Position. *A*, correctly made radiogram of tooth; the other seven radiograms of same case show different degrees of distortion due to improper angle at which cone was adjusted, film being in same position in seven radiograms as in *A*.

the first and second molars are visible, with an extensive overlap of the second molar upon the first, obliterating the root formations of the first and second molars and also the interproximal space between these two teeth, and the definition of their enamel caps and pulp chambers is lost.

In Fig. 19 H the first, second and third molars are inclined lingually, as parts of the occlusal surfaces of the first and second molars are visible, and the ossistructure on the distal surface is located farther distally than its position is shown to be in the correct radiogram in Fig. 19 A. The third molar roots appear to be fused, and there is only a slight outline of the pulp chamber of the tooth. There are overlaps of the third molar upon the second, and of the second molar upon the first.

FOURTH SPECIMEN

Horizontal Impaction.—In Fig. 20 are shown eight radiograms of a mandibular third molar impacted in a horizontal position. It will be observed that of these eight radiograms no two are alike, and yet they are radiograms of the same tooth. In order to present the salient features of the various radiograms, a description of the illustrations is given.

Figure 20 A shows a correctly made radiogram of an impacted third molar in a horizontal position, with the distal surface of the crown extending above the occlusal surface of the second molar. The roots are fused, and the outlines of the enamel cap, pulp chamber and canals are distinctly seen. There is no overlap of the occlusal surface of the third molar upon the distal surface of the second, and the interproximal space between the first and second molars is normal.

In Fig. 20 B there is an extensive overlap of the occlusal surface of the third molar upon the distal surface of the second, and the ossistructure on the distal surface is located farther distally than in Fig. 20 A. The crown of the third molar appears much larger, but the roots are shortened. The second molar is elongated and overlaps the first. The outlines of the enamel caps, pulp chambers and canals of the three molars are lost.

In Fig. 20 C the third molar is greatly elongated, and the occlusal surface of the tooth overlaps the distal surface of the second. The occlusal surface of the third molar is visible, but the distal ossistructure, enamel cap and pulp chamber are lost. There is a slight overlap at the contact of the second molar with the first, and the enamel cap and pulp chamber of the second molar are clearly shown.

In Fig. 20 D the third molar is located at an angle to the second molar and appears larger, overlapping the second. The occlusal surface of the second molar is visible, but the crown is smaller and the tooth is shortened. The contact point between the first and second molars shows an overlap.

In Fig. 20E the third molar is greatly elongated. There is a slight lingual inclination of the crown of the second molar and the occlusal surface is visible. The contact point between the first and second

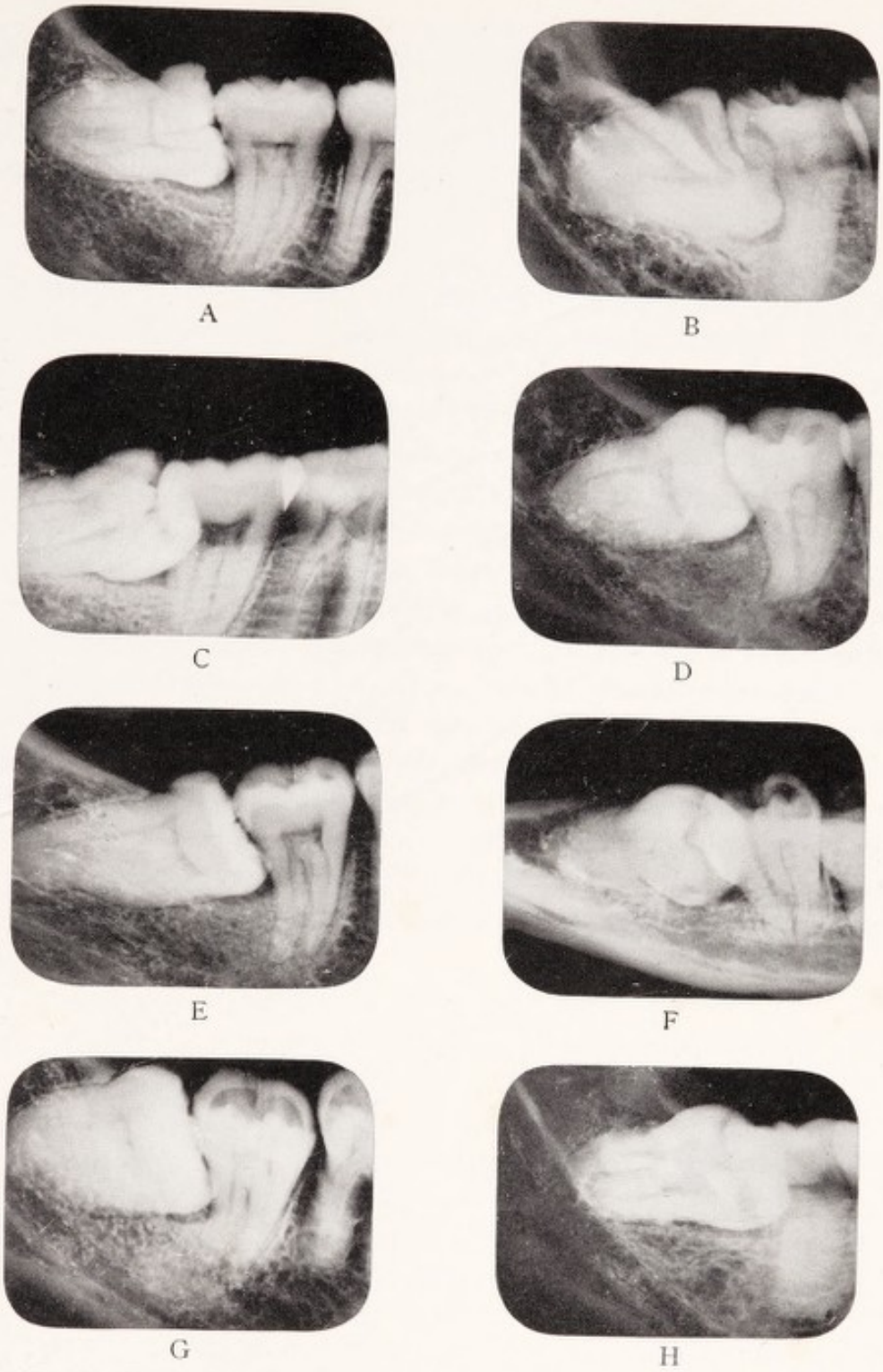


Fig. 20.—Eight Radiograms of a Mandibular Third Molar Impacted in a Horizontal Position. *A*, correctly made radiogram of tooth; the other seven radiograms of same case show different degrees of distortion due to improper angle at which cone was adjusted, film being placed in same position in seven radiograms as in *A*.

molars is nearly normal, similar to that shown in Fig. 20 A. The roots of the second molar are slightly shortened, but the pulp chamber is clearly outlined.

In Fig. 20 F there is a great distortion of the first, second and third molars. The third molar has a decided lingual inclination, and there

is an extensive overlap of the third molar upon the second. The enamel cap, pulp chamber and root formation of the third molar are lost, and the ossistructure surrounding this tooth is entirely obliterated. The mandible appears to come to a point immediately distal to the root of the third molar. The first and second molars are inclined distally, and there is a slight overlap of the second upon the first.

In Fig. 20 G the crown of the third molar is greatly enlarged, but the tooth is shortened, and there is a slight overlap of the third molar upon the second. The ossistructure on the distal surface of the third molar extends up to the gingival third of the tooth. The crowns of the first and second molars are inclined lingually with a shortening of the roots, but the outlines of the enamel caps and pulp chambers of the two teeth are lost. The space at the contact point between the first and second molars is increased, as is also the space between the mesial and distal roots of these teeth.

In Fig. 20 H the size of the crown of the third molar is increased, with a slight elongation of the tooth, and the overlap of the third molar upon the second covers one half of the crown of the latter tooth. The ossistructure on the distal surface of the third molar covers nearly the entire crown of the tooth. The outlines of the enamel caps and pulp chambers of the first and second molars are lost. The gingival margin at the interproximal space between the first and second molars appears to be affected extensively by caries.

CHAPTER V

Radiographic Interpretation of the Crown of the Impacted Mandibular Third Molar

AFTER the radiogram has been made according to the method described in "Radiographic Technic" (page 12), the operator carefully studies the radiogram and endeavors to interpret correctly every diagnostic point that it may present, as the technic to be followed for the extraction of the tooth, described in the various chapters on "Operative Technic," will be governed by this interpretation. If the film has been dried, it may be studied over an x-ray illuminating box, or with a bright light reflected against a white surface; and, if the film is wet, it may be studied by placing it in a clear glass bowl of cold water having a light underneath the bowl for illumination.

The diagnostic points to be interpreted in connection with the impacted third molar are studied in the following order: crown, roots, ossistructure supporting the tooth, interproximal space, peridental membrane and mandibular canal, in addition to which a study is made for the presence of a cyst or odontoma and such abnormalities as a supernumerary tooth or fourth molar that are occasionally found in the region of the third molar.

In order that the extraction may be properly conducted, a standardized technic of a definite character should be followed. For the purpose of establishing a definite method for the extraction of an impacted third molar, thousands of radiograms of impacted third molars were studied and systematically classified into groups of analogous characteristics. The diagnostic points of each radiogram were carefully determined and analyzed before assigning the case to a certain group, and then a technic for that group was developed.

The data obtained by the analyses of radiograms for the purpose of preparing an operative technic for each group of impactions demonstrated the importance of making a radiogram of each case and determining the diagnostic points in advance as a guide for the operative procedure.

A diagnostic point that has been overlooked in the interpretation of a radiogram may result in an annoying incident, such as the fracture of the crown or roots, unnecessary excision of the ossistructure, injury to the second molar, or trauma resulting from unnecessary manipulation of the gum tissue, tooth or ossistructure. The most

satisfactory operative results are obtained where the operation is executed in an efficient manner and with as few technical movements as possible. With this ideal procedure in view, in which guesswork is to be eliminated and trauma is to be reduced to a minimum, such diagnostic points as the operator must interpret from the radiogram before operating on an impacted third molar are described in this and the following chapters.

A complete description of the radiographic interpretation of the second molar, including the character of its crown, roots and supporting ossistructure, is given in Chapters VIII, IX and X.

CONSIDERATION OF THE CROWN

When interpreting the radiogram, the crown should receive the first consideration. The position, size and shape of the crown, and its contact with the second molar are carefully noted; its alignment with the arch and any lingual or buccal deflection are analyzed; in case there is a torsion, its character is determined, and any caries involving the crown is studied. In addition to these observations, an effort is made to ascertain to what extent, if any, a previous attempt has been made to extract the tooth by the application of exolever or forceps, and any abnormalities connected with the tooth are thoroughly studied in advance of any operative procedure.

POSITION OF THE CROWN

The positions in which the crown of the third molar may occur are determined from the radiogram, and are of four principal types—vertical, mesioangular, distoangular and horizontal. Each type may be in alignment with the second molar when comparing the buccal and lingual surfaces of the crown of the third molar with the corresponding surfaces of the second. The crown of the third molar in either of the four positions may be deflected buccally or lingually out of alignment with the second molar; it may be deflected both buccally and lingually in what is termed a buccolingual deflection, or it may be in a torsional position.

Where the crown of the third molar is in a vertical position, its occlusal surface may be in alignment with the corresponding surface of the second, or it may be below that surface, and the mesial surface of the third molar may or may not be in contact with the distal surface of the second.

Where the crown of the third molar is in a mesioangular position, its occlusal surface will be in an angular position mesially as compared with the occlusal surface of the second, and its mesial surface may or may not be in contact with the distal surface of the second molar, or

a part of its occlusal surface may be in contact with a part of the distal or distobuccal surface of the second molar.

Where the crown of the third molar is in a distoangular position, its occlusal surface will be in an angular position distally as compared with the corresponding surface of the second, and its mesial surface may or may not be in contact with the distal surface of the second molar.

Where the crown of the third molar is in a horizontal position, its occlusal surface will be in a vertical position compared with the corresponding surface of the second, and a part or the whole of its occlusal surface may or may not be in contact with the distal or distobuccal surface of the second molar.

A comparative study of the various positions in which the crown may be found is invaluable in the execution of the operative technic and should be considered in the interpretation.

Vertical Impaction.—Where the crown of the third molar is in a vertical position, as shown in Fig. 21, presenting two types of this kind of impaction, a character of impaction is presented that is susceptible to many variations in the position of the crown compared

Fig. 21.—Position of Crown—Vertical Impaction. Vertical type of impacted mandibular third molar, showing variation in position of crown of third molar compared with crown of second.

with the crown of the second molar. These two cases are of sufficient variation in reference to the position of the crown to give the operator a good idea of this type of impaction. Few vertical impactions are found where the occlusal surface of the third molar is below the supe-

Fig. 22.—Position of Crown—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, showing variation in position of crown of third molar compared with crown of second.

rior border of the ossistructure, and in the majority of vertical impactions the occlusal surface of the third molar is in alignment with, or a short distance below, the corresponding surface of the second, or is located at the gingival third of that tooth.

Mesioangular Impaction.—Where the crown of the third molar is in a mesioangular position, as shown in Fig. 22, presenting two types of this kind of impaction, a series of variations in the position of the crown of the third molar compared with the crown of the second is presented. The mesioangular position is the most common of the angular type.

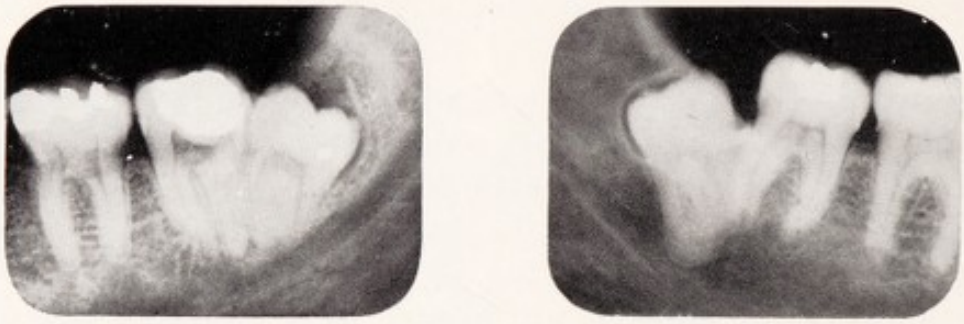


Fig. 23.—Position of Crown—Distoangular Impaction. Distoangular type of impacted mandibular third molar, showing variation in position of crown of third molar compared with crown of second.

Distoangular Impaction.—Where the crown of the third molar is in a distoangular position, a condition is presented that is not as common as a vertical or mesioangular impaction. In Fig. 23 are shown two types of this kind of impaction, and a study of these cases will show marked variations in the position of the crown of the third molar compared with the crown of the second.

Horizontal Impaction.—Where the crown of the third molar is in a horizontal position, a character of impaction is presented that is susceptible to many variations. In Fig. 24 are shown two types of this kind of impaction, and a comparison can be made of the various positions of the crown of the third molar with the crown of the second.

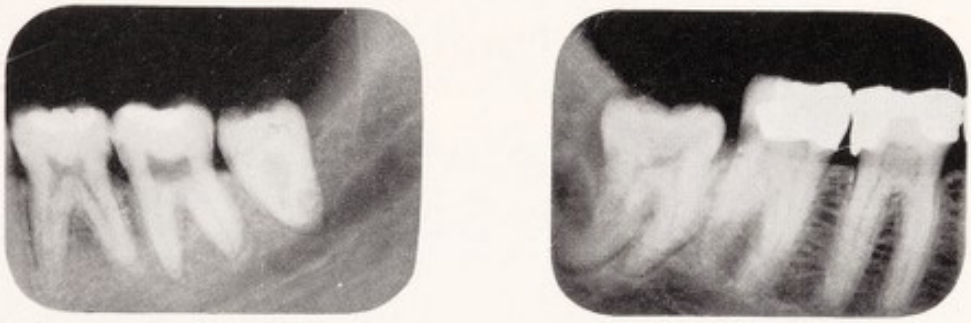
Positions in which the crown of the third molar may appear, in addition to vertical, mesioangular, distoangular or horizontal, are

Fig. 24.—Position of Crown—Horizontal Impaction. Horizontal type of impacted mandibular third molar, showing variation in position of crown of third molar compared with crown of second.

linguoangular, buccoangular, complete lingual, and in some cases anomalous positions, which are described under their respective headings.

SIZE AND SHAPE OF THE CROWN

The position of the tooth having been determined, a study is made of the size and shape of the crown. As the crowns of impacted third molars vary materially in size, ranging from comparatively small to abnormally large, the size and shape of the crown as shown by the radiogram is carefully studied, and this will indicate the size and shape of the exolever blade to be used. The size of the crown will also indicate the amount of ossistructure that is to be excised on the mesial, mesiobuccal, distal, buccal and lingual surfaces, and this will determine the size of the ossisector blade to be used for excising the ossistructure. The size and shape of the buccal surface should be especially noted in the vertical and angular impactions in order to determine the size and shape of the exolever blade to be adjusted, so that an application of the proper instrument may be correctly made, when indicated, on the buccal surface.



A B

Fig. 25.—Size and Shape of Crown—Vertical Impaction. Vertical type of impacted mandibular third molar, showing variation in size and shape of crown. *A*, very small crown; *B*, large crown.

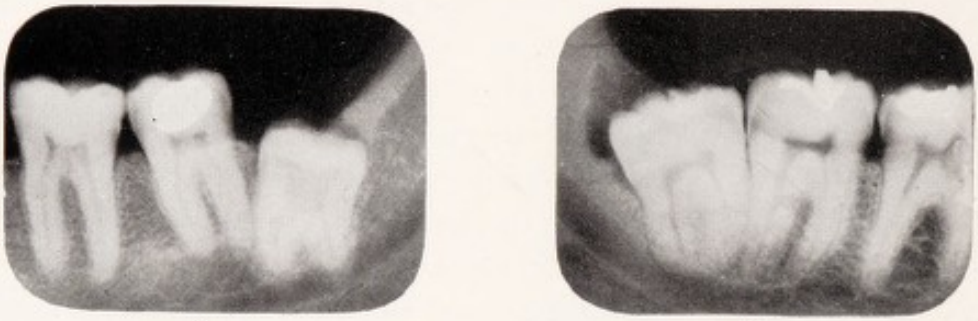
Vertical Impaction.—In Fig. 25 are shown two cases of variation in the size and shape of the crown when in a vertical position. In Fig. 25 A the crown is of a very small type, and in Fig. 25 B the crown is of a large type.

A B

Fig. 26. — Size and Shape of Crown — Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, showing variation in size and shape of crown. *A*, very small crown; *B*, large crown.

Mesioangular Impaction.—In Fig. 26 are shown two cases of variation in the size and shape of the crown when in a mesioangular position. In Fig. 26 A the crown is of a very small type, and in Fig. 26 B the crown is of a large type.

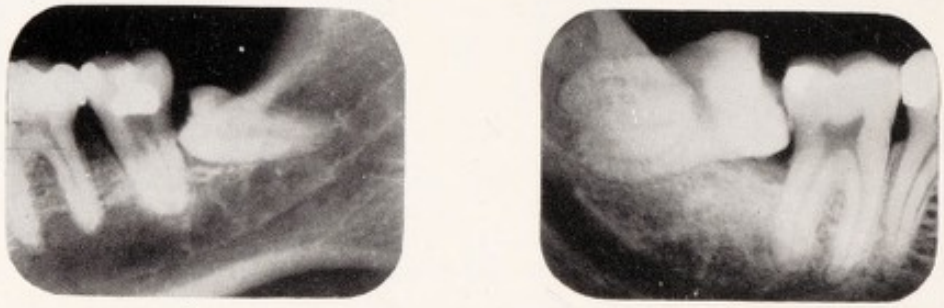
Distoangular Impaction.—In Fig. 27 are shown two cases of variation in the size and shape of the crown when in a distoangular position. In Fig. 27 A the crown is of a very small type, and in Fig. 27 B the crown is of a large type.



A B

Fig. 27. — Size and Shape of Crown — Distoangular Impaction. Distoangular type of impacted mandibular third molar, showing variation in size and shape of crown. *A*, very small crown; *B*, large crown.

Horizontal Impaction.—In Fig. 28 are shown two cases of variation in the size and shape of the crown when in a horizontal position. In Fig. 28 A the crown is of a very small type, and in Fig. 28 B the crown is of a large type.



A B

Fig. 28.—Size and Shape of Crown—Horizontal Impaction. Horizontal type of impacted mandibular third molar, showing variation in size and shape of crown. *A*, very small crown; *B*, large crown.

CONTACT OF THE CROWN WITH THE SECOND MOLAR

The position, size and shape of the crown of the third molar having been determined, the operator should note whether the radiogram shows the occlusal or mesial surface to be in contact with the distal or distobuccal surface or distal root of the second molar, and, if there is such a contact, he should determine its location. Cases where the third molar is in contact with the distal or distobuccal surface of the second should be differentiated from those cases where there is no contact.

While some vertical, angular and horizontal impactions where the third molar is not in contact with the second will present an advantageous condition for operation, there are some impactions of this kind that will complicate the condition. There are also some cases where the operation would be simplified if there were a contact and the buccal surface of the third molar were deflected buccally out of alignment with the buccal surface of the second molar, as the contact, together with the buccal deflection of the crown of the third molar, will allow a more favorable excision of the ossistructure. For example, where the mesial surface, in an angular or a horizontal position, is below the superior border of the ossistructure and the crown is not in contact or is not deflected buccally, the excision to obtain access to the mesial surface for the application of the exolever must be made in the region of the mesiobuccal surface. If, however, the crown is deflected buccally, the excision can be made at that part of the occiusal or mesial surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second molar, and one can thereby avoid excising the ossistructure on the buccal surface, which structure is more difficult to excise in the majority of cases on account of the density of the ossistructure in that region. It will, therefore, be noted that it is essential for the operator to determine

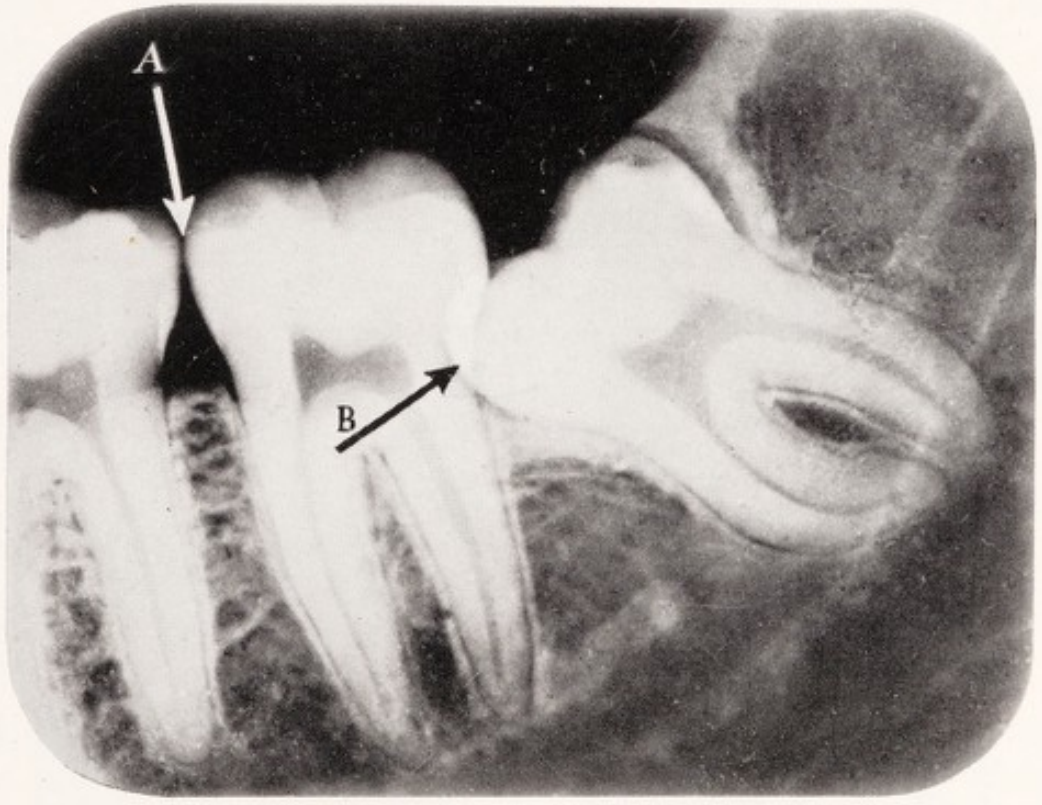


Fig. 29. — Crown Contact — Mesioangular Impaction. A correctly made radiogram of an impacted mandibular third molar in a mesioangular position. *A*, approximately normal relation of contact of first molar with second, but with no overlap of crown of first molar upon second; *B*, overlap of contact of crown of third molar on second, which indicates a deflection of third molar.

whether there is a contact of the crown of the third molar with the crown of the second, and whether there is a buccal deflection of the third molar.

A radiogram of an impacted third molar will show the location of the contact of the crown, if such contact is present, and to what extent the occlusal or mesial surface of the third molar may be in contact with the distal or distobuccal surface or distal root of the second molar—an important diagnostic point.

In Fig. 29 is shown the crown contact of the first and second molars, with no overlap; also a contact of the second and third molars, with a decided overlap. The occlusal and mesial surfaces of the third molar are studied in connection with the distal surface and distal root of the second, and the radiogram, if it has been correctly made, should not show an overlap of the crown of the first molar upon the second (Fig. 29 A). If, however, the radiogram shows an overlap of the crown of the third molar upon the crown or root of the second, with no overlap of the first molar upon the second (Fig. 29 B), the overlap of the third molar will be evidence of a displaced contact, which condition is treated in "Buccal Deflection" (page 59). A study is made of the character of the contact of the third molar with the distal or distobuccal surface or distal root of the second molar in order to determine to what extent both molars may be involved, and with an interpretation of the ossistructure, this study will indicate the kind of access that may be obtained for the exolever to be applied to the mesial surface of the third molar and the structure to be used as a fulcrum.

NO CONTACT OF THE CROWN WITH THE SECOND MOLAR

Vertical Impaction.—In Fig. 30 are shown two types of the third molar impacted in a vertical position, with no contact of the mesial surface of the crown of the third molar with the distal surface of the second. In these two cases are presented the variations that may occur in this type of impaction, and the position of the two teeth will enable the operator to estimate the space that will be available for the

Fig. 30.—No Contact of Crown—Vertical Impaction. Vertical type of impacted mandibular third molar, showing no contact of mesial surface of crown of third molar with distal surface of second.

application of the exolever to the mesial or mesiobuccal surface of the third molar.

Mesioangular Impaction.—In Fig. 31 are shown two types of the third molar impacted in a mesioangular position, with no contact of the occlusal or mesial surface of the crown of the third molar with the distal surface of the second, and the position of the two teeth will enable the operator to estimate the space that will be available for the application of the exolever to the mesial surface of the third molar.

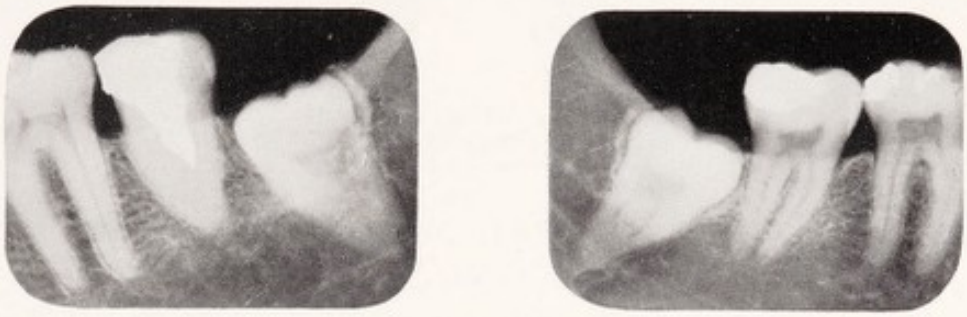


Fig. 31.—No Contact of Crown—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, showing no contact of occlusal or mesial surface of third molar with distal surface of second.

Distoangular Impaction.—In Fig. 32 are shown two types of the third molar impacted in a distoangular position, with no contact of the mesial surface of the crown of the third molar with the distal surface of the second. In these two cases are presented the variations that may occur where there is no contact of the mesial surface of the third molar with the distal surface of the second, and the position of the two teeth will enable the operator to estimate the space that will be available for the application of the exolever to the mesial or mesiobuccal surface of the third molar.

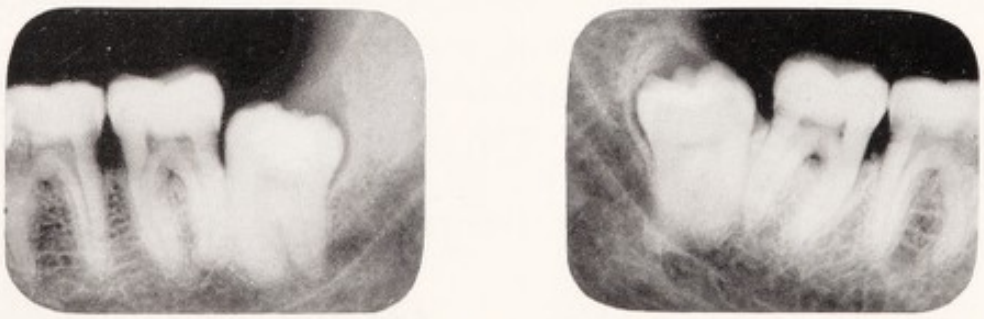


Fig. 32.—No Contact of Crown—Distoangular Impaction. Distoangular type of impacted mandibular third molar, showing no contact of mesial surface of third molar with distal surface of second.

Horizontal Impaction.—In the majority of horizontal types of impaction a part of the occlusal surface of the crown of the third molar is in contact with the distal or distobuccal surface of the second molar. Where, however, there is no such contact, as shown in Fig. 33, where the two cases present considerable variation in the space between the

second and third molars, a study is made of the space in each case and also of the interseptum, when present, between the occlusal surface of the third molar and the distal surface of the second.

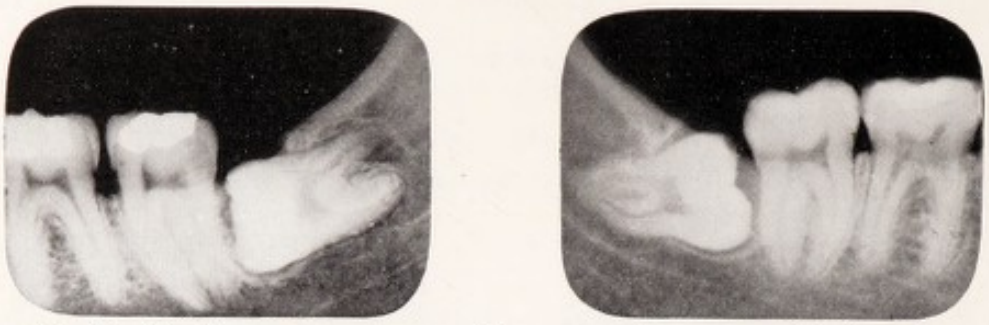


Fig. 33.—No Contact of Crown—Horizontal Impaction. Horizontal type of impacted mandibular third molar, showing no contact of occlusal surface of third molar with distal surface of second.

CONTACT OF THE OCCLUSAL OR MESIAL SURFACE WITH THE SECOND MOLAR

Vertical Impaction.—In Fig. 34 are shown two types of the third molar impacted in a vertical position, with variation in the location of the contact of the mesial surface of the crown of the third molar with the distal surface of the second. The contact, which approximates a normal, and which may be slightly below the occlusal surface of the second molar and may vary from that point to and below the gingival third of the tooth, is studied to determine the access for the exolever. This access is governed by the distance between the contact and the occlusal surface of the second molar, and to ascertain to what extent the mesial surface of the third molar is in contact with the distal surface of the second. Where a contact is present in a vertical type, as shown in the two cases, the available space between the second and third molars will be decidedly different from a case where there is no contact, and will require a technic to conform to the contact and its location as shown by the radiogram.

Mesioangular Impaction.—In Fig. 35 are shown two types of the mandibular third molar impacted in a mesioangular position, with variation in the location of the abnormal contact of the occlusal or

Fig. 34.—Contact of Third Molar with Second Molar—Vertical Impaction. Vertical type of impacted mandibular third molar, showing variation in location of contact of mesial surface of third molar with distal surface of second.

mesial surface of the crown of the third molar with the distal surface of the second. As the mesial inclination of the crown of the third molar and its contact with the distal surface of the second molar may

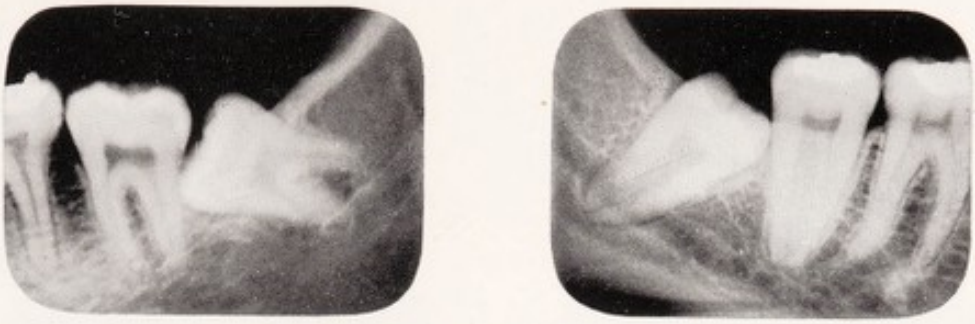


Fig. 35. — Contact of Third Molar with Second Molar — Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, showing variation in location of contact of occlusal or mesial surface of third molar with distal surface of second.

simplify or complicate the operative procedure, a study is made of the location and extent of the contact. Where the contact is below the gingival third of the second molar, a study is also made of the distal surface of the distal root of the second molar. A contact involving the distal surface of the distal root of the second molar often produces a pressure sufficient to deflect the second molar, causing destruction of the peridental membrane at the point of contact, and caries or an absorption may also be present. The mesial surface of the third molar is the part usually in contact with the distal surface of the second, and occasionally a part of the occlusal surface of the third molar is in contact with the distal surface of the second.

Distoangular Impaction.—In Fig. 36 are shown two types of the third molar impacted in a distoangular position, with variation in the location of the abnormal contact of the mesial surface of the crown of the third molar with the distal surface of the second. In the majority of cases where the crown of the third molar is in a distoangular position the crown will not be in contact with the distal surface of the second.

Fig. 36. — Contact of Third Molar with Second Molar — Distoangular Impaction. Distoangular type of impacted mandibular third molar, showing variation in location of contact of mesial surface of third molar with distal surface of second.

Horizontal Impaction.—In Fig. 37 are shown two types of the third molar impacted in a horizontal position, with variation in the location and extent of abnormal contact of the occlusal surface of the crown of the third molar with the distal surface of the second. In case the contact is below the gingival third of the second molar, to which condition reference is made above in the description of the mesioangular type, a study is made of the distal root of the second molar to determine whether the tooth can be retained or whether it is involved to such an extent as to indicate its extraction.

Fig. 37.—Contact of Third Molar with Second Molar—Horizontal Impaction. Horizontal type of impacted mandibular third molar, showing variation in location of contact of occlusal surface of third molar with distal surface of second.

ALIGNMENT OF THE CROWN

After an interpretation has been made of the position, size and shape of the crown of the third molar, and also of its contact with the second molar, the character of the alignment of the third molar with the second is determined clinically, wherever possible, and checked with the radiogram. Where, however, this course is not practicable without an extensive explorative examination, the alignment is determined from the radiogram in advance of any operative procedure. The alignment of the buccal and lingual surfaces of the crown of the third molar with the corresponding surfaces of the second is to be determined. The buccal surface of the crown of the third molar in either of the four positions described—vertical, mesioangular, distoangular and horizontal—may be deflected buccally or lingually out of alignment with the buccal surface of the second molar. The occlusal surface of the third molar may be in alignment with the corresponding surface of the second, and it may be deflected buccally or lingually. In the majority of cases it is deflected lingually. These advance interpretations will indicate to the operator the direction in which the mesial, distal and buccal surfaces are to be approached for the excision of the ossistructure, the extent to which the excision is to be made, and the application of the exolever to the mesial, mesiobuccal and buccal surfaces.

ALIGNMENT OF THE OCCLUSAL SURFACE WITH THE SECOND MOLAR

Where the crown of the third molar is in a vertical position, the alignment of its occlusal surface with the corresponding surface of the second molar is studied in the radiogram to determine the distance between the occlusal surface of the third molar and the corresponding surface of the second. This examination will indicate the design of instrument to be used in the operative technic, as the farther the crown of the third molar is from the occlusal surface of the second, the more difficult it will be to gain access. The gingival third of the third molar may also be used as a guide instead of the occlusal surface to determine the distance for access and the distance between the gingival third and the occlusal surface of the second. The extreme posterior location of the tooth, together with the limited opening of the mouth, requires a careful study as to access, and the operator should take advantage of every detail shown in the radiogram that indicates a lessening of any operative difficulty that may be presented. A study of the prevailing condition will also determine the length of the shank and the size of the blade of the instrument to be used.

The operator, when interpreting the radiogram, should draw an imaginary line distally from the occlusal surface of the second molar in order to determine the extent of deflection of the crown of the third molar from the crown of the second. This study of the radiogram, including the character of the superior border of the ossistructure on the buccal surface, described on page 139, is very important on account of the many variations in the position of the crown that may be presented. The alignment of the occlusal surface of the first molar is compared with the corresponding surface of the second. The crown of the third molar, when in contact with the distal or distobuccal surface or distal root of the second, may produce sufficient pressure to force the second molar upward, causing the occlusal surface of the latter tooth to be out of alignment with the corresponding surface of the first molar. In a distoangular impaction the pressure of the mesial root of the third molar against the distal root of the second may cause the occlusal surface of the latter tooth to be above the corresponding surface of the first molar.

Vertical Impaction.—In Fig. 38 are shown four types of the third molar impacted in a vertical position with diagnostic lines drawn distally from the occlusal surfaces of the first and second molars, presenting a variation in the alignment of the occlusal surface of the third molar with the corresponding surfaces of the first and second molars.

Mesioangular Impaction.—Where the crown of the third molar is in a mesioangular position, the alignment of its occlusal surface is

deflected from the corresponding surface of the second molar, and the access is examined as in the case of a vertical impaction. In this type of a case, in addition to comparing the two occlusal surfaces, the mesial surface of the third molar is used as a guide for determining the distance between the crown and the occlusal surface of the second.

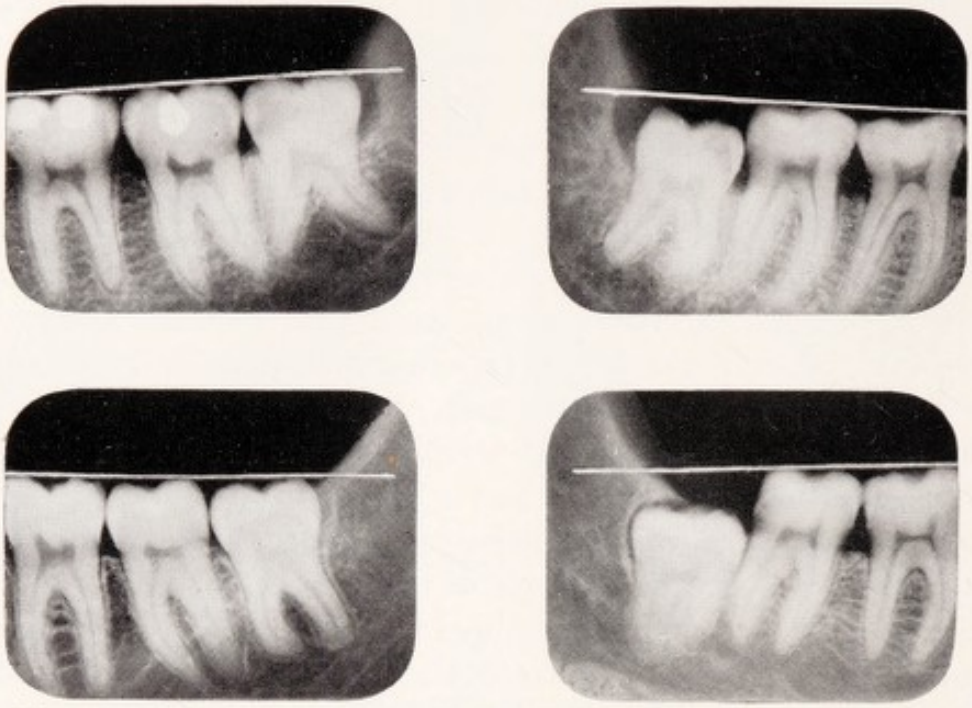


Fig. 38. — Crown Alignment — Occlusal Surface — Vertical Impaction. Vertical type of impacted mandibular third molar, with a diagnostic line drawn distally from occlusal surface of first and second molars, showing variation in alignment of crown of third molar with occlusal surface of second.

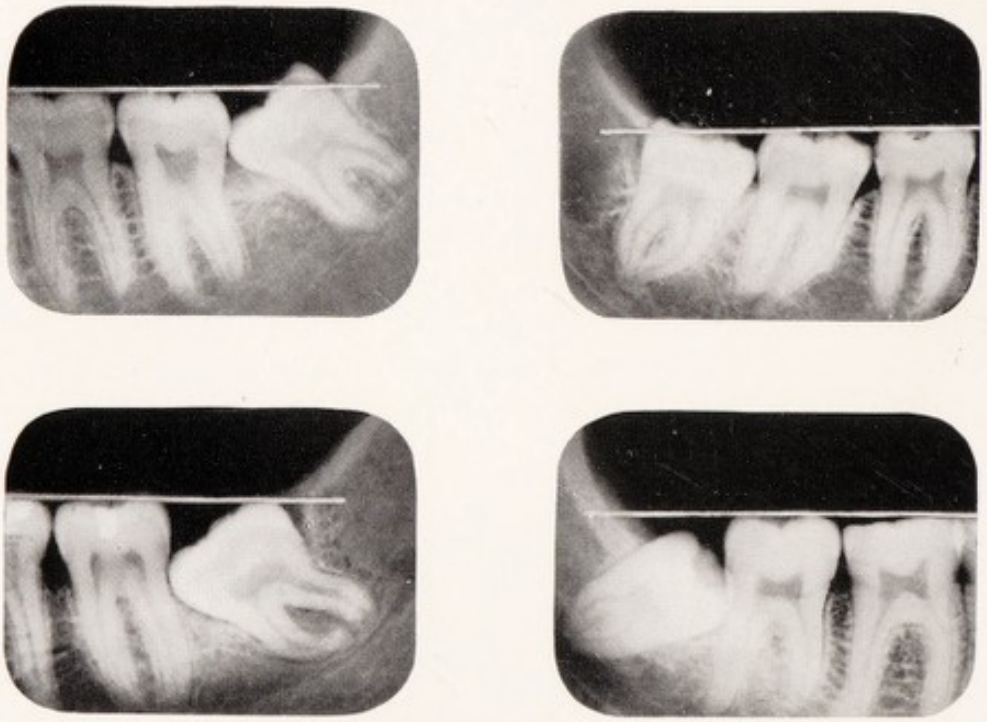


Fig. 39.—Crown Alignment—Occlusal Surface—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, with a diagnostic line drawn distally from occlusal surface of second molar, showing variation in alignment of crown of third molar with occlusal surface of second.

In Fig. 39 are shown four types of the third molar impacted in a mesioangular position, with a diagnostic line drawn distally from the occlusal surface of the second, presenting a variation in the alignment of the occlusal and mesial surfaces of the third molar with the occlusal surface of the second.

Distoangular Impaction.—Where the crown of the third molar is in a distoangular position, its occlusal surface, as in the mesioangular position, is deflected from the corresponding surface of the second, and an examination is made of the occlusal, mesial and distal surfaces of the third molar.

In Fig. 40 are shown four types of the third molar impacted in a distoangular position, with a diagnostic line drawn distally from the occlusal surface of the second, indicating a deflection in the alignment of the occlusal surface of the third molar from the corresponding surface of the second. In this type of a case the mesial and distal surfaces of the third molar should be used as a guide for determining the distance of the third molar from the second for the purpose of gaining access to the third molar.

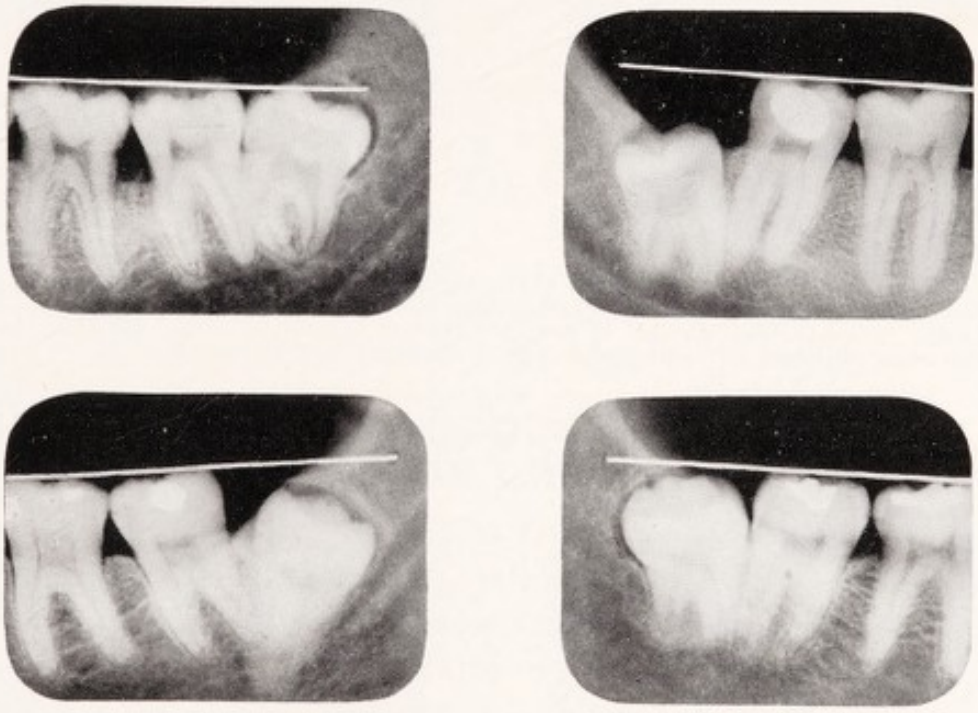


Fig. 40.—Crown Alignment—Occlusal Surface—Distoanghlar Impaction. Distoangular type of impacted mandibular third molar, with a diagnostic line drawn distally from occlusal surface of first and second molars, showing variation in alignment of crown of third molar with occlusal surface of second.

Horizontal Impaction.—Where the crown of the third molar is in a horizontal position, its occlusal surface will be in vertical alignment with the distal surface of the second, and, when the diagnostic line is drawn distally, the position of the occlusal surface of the third molar compared with the corresponding surface of the second will be observ-

able. In addition to comparing the two occlusal surfaces, the mesial surface of the third molar is compared with the occlusal surface of the second.

In Fig. 41 are shown four types of the third molar impacted in a horizontal position, with a diagnostic line drawn distally from the occlusal surfaces of the first and second molars, indicating the variation in the alignment of the occlusal and mesial surfaces of the third molar with the occlusal surface of the second.

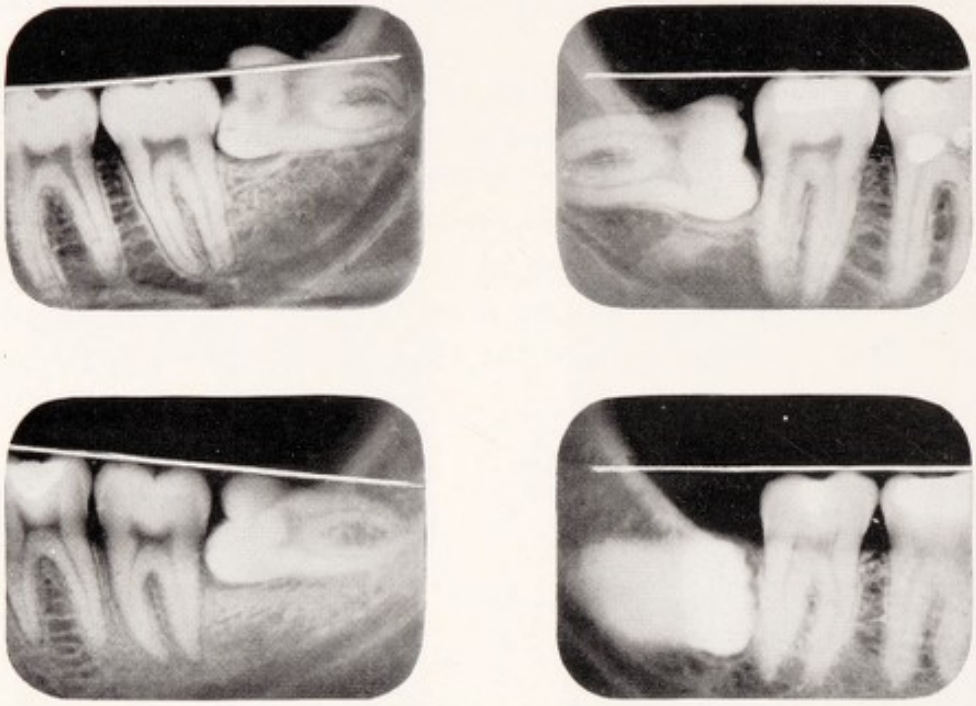


Fig. 41. — Crown Alignment — Occlusal Surface — Horizontal Impaction. Horizontal type of impacted mandibular third molar, with a diagnostic line drawn distally from occlusal surface of first and second molars, showing variation in alignment of crown of third molar with occlusal surface of second.

ALIGNMENT OF THE BUCCAL SURFACE WITH THE SECOND MOLAR

Whatever may be the position of the crown of the third molar—vertical, mesioangular, distoangular or horizontal—the alignment of its buccal surface should be determined clinically, where possible, by an ocular, a digital or an instrumental examination, and by comparing its position with the arch and buccal surface of the second molar. Where, however, it is not practicable to make a clinical examination, the alignment is determined by the interpretation of the radiogram, a comparative study being made of the occlusal surfaces, enamel caps, pulp chambers, pulp canals and crown contacts of the second and third molars. These diagnostic points are, as a rule, sufficient to determine the alignment, but in some cases it will be necessary to make an occlusal radiogram to determine the true alignment, as described in "Radiographic Technic" (page 21).

It is very important to know in advance of any operative procedure the alignment of the buccal surface of the crown of the third molar with the corresponding surface of the second, and, in addition, such other diagnostic points as have been previously mentioned should be determined. For example, where the buccal surface of the crown of the third molar is in alignment with the corresponding surface of the second, an entirely different approach to the mesial surface with an ossisector or exolever is indicated than where the buccal surface is out of alignment with the second molar and is deflected buccally or lingually out of the arch or buccally or lingually out of alignment with the buccal surface of the second molar.

NO DEFLECTION

Where the buccal surface of the crown of the third molar is in alignment with the corresponding surface of the second, the radiogram will not, as a rule, show a marked contact of the crown of the third molar with the distal surface or distal root of the second, and, if such contact is present, no overlap upon the second molar will be shown. The enamel caps, pulp chambers and canals of the first, second and third molars are usually outlined as distinctly in one tooth as in the other, if the radiogram has been correctly made, but no part of the occlusal surface of the third molar will be shown in the radiogram. There must, however, be no overlap at the contact point of the first and second molars.

Vertical Impaction.—In Fig. 42 are shown two types of the third molar impacted in a vertical position, with the buccal surface of the crown of the third molar in alignment with the corresponding surface of the second, and a comparative study is made of the various diagnostic points described above in connection with these two cases.

Fig. 42.—Crown Alignment—No Deflection—Vertical Impaction. Vertical type of impacted mandibular third molar, with buccal surface of crown of third molar in alignment with corresponding surface of second.

Mesioangular Impaction.—In Fig. 43 are shown two types of the third molar impacted in a mesioangular position, with the buccal surface of the crown of the third molar in alignment with the corresponding surface of the second, and an examination of these two cases,

which vary in their angular positions, will present the diagnostic points mentioned above in the case where there is no deflection.

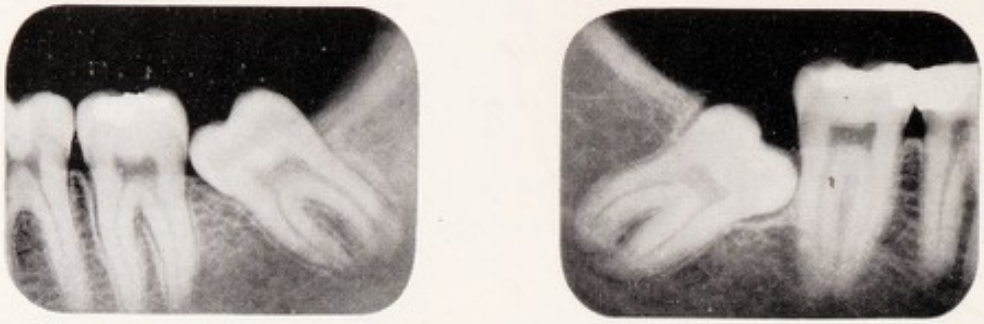


Fig. 43. — Crown Alignment — No Deflection — Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, with buccal surface of crown of third molar in alignment with corresponding surface of second.

Distoangular Impaction.—In Fig. 44 are shown two types of the third molar impacted in a distoangular position, with the buccal surface of the crown of the third molar in alignment with the corresponding surface of the second, and an examination of these two cases, which vary in their angular positions, will present the diagnostic points mentioned above in the case where there is no deflection.

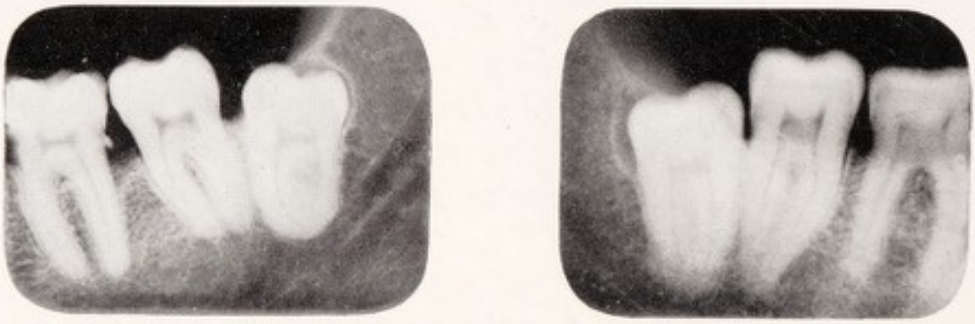


Fig. 44. — Crown Alignment — No Deflection — Distoangular Impaction. Distoangular type of impacted mandibular third molar, with buccal surface of crown of third molar in alignment with corresponding surface of second.

Horizontal Impaction.—In Fig. 45 are shown two types of the third molar impacted in a horizontal position, with the buccal surface of the crown of the third molar in alignment with the corresponding surface of the second, and an examination of these two cases, which vary in their horizontal positions, will present the diagnostic points mentioned above in the case where there is no deflection.

Fig. 45.—Crown Alignment—No Deflection—Horizontal Impaction. Horizontal type of impacted mandibular third molar, with buccal surface of crown of third molar in alignment with corresponding surface of second.

For the purpose of describing conveniently the technic where the buccal surface of the crown of the third molar is in alignment with the corresponding surface of the second, the condition will be designated in a vertical, mesioangular, distoangular or horizontal impaction as a case where there is no deflection.

BUCCAL SURFACE OUT OF ALIGNMENT WITH THE SECOND MOLAR

The crown of the impacted third molar will often be deflected toward the buccal or lingual side of the arch, and, where the crown is in either of these positions, the buccal and lingual surfaces of the tooth will be out of alignment with the corresponding surfaces of the second molar.

The most common deflection of the crown of the third molar is buccally out of alignment with the buccal surface of the second, and a lingual deflection, while of frequent occurrence, is not so often seen as is a buccal deflection. In some cases the deflection may be of a compound character; that is, a part of the crown of the third molar may be deflected buccally out of alignment with the second and its occlusal surface may be deflected lingually.

One of the important objects in the exolever technic is to be able to apply the blade of the instrument to the mesial surface of the third molar, and at the same time secure a suitable fulcrum near the point where the instrument engages the mesial surface, without injuring the second molar or its supporting ossistructure. As the direction and degree of deflection will govern this technic, it is essential that the prevailing conditions be intelligently interpreted in advance of any operative procedure.

BUCCAL DEFLECTION

Where the buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second, the extent of the deflection will vary in different cases. While such a deflection renders it difficult to apply the exolever to the buccal surface of the third molar, the farther the third molar is deflected buccally the easier it will be to gain access to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second, which condition is more favorable for the application of the exolever than where the tooth is in alignment with the second molar or where it is deflected lingually.

In the application of the exolever technic the deflection is an advantage, as it obviates, in the majority of cases where the crown is in a vertical, an angular or a horizontal position, the excision of any ossistructure on the buccal surface of the third molar. The deflection

also avoids the liability of forcing the third molar lingually into the soft tissue, an incident that may occur in the extraction of an impacted third molar. The operator takes advantage of this deflection, when excising the ossistructure for the purpose of applying the exolever by making the approach with the instrument (1) to that part of the mesial surface of the crown of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second where the tooth is in a vertical position; (2) to that part of the occlusal and mesial surfaces of the crown of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second where the tooth is in a mesioangular position; (3) to that part of the mesial surface of the crown of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second where the tooth is in a distoangular position, and (4) to that part of the occlusal and mesial surfaces of the crown of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second where the tooth is in a horizontal position. The ossistructure on the mesial surface anterior to the deflected tooth in a vertical or an angular position, or the ossistructure on the occlusal surface where the tooth is in a horizontal position, is more easily excised than the ossistructure on the buccal surface, and is more readily accessible to the blade of the ossisector and to the application of the exolever.

A radiogram will show a buccal deflection of the crown of the third molar, when the latter is in contact with the distal surface of the second, by an overlap at the contact point of the occlusal or mesial surface of the third molar upon the distal surface or distal root of the second (Fig. 29 B, page 47), but there should not be at the contact point an overlap of the crown of the first molar upon the second if the radiogram is to be correct (Fig. 29 A, page 47). The operator should always study the contact point of the first molar with the second before studying the contact of the occlusal or mesial surface of the third molar with the distal surface of the second, as such a procedure will obviate an error in the diagnosis of a case, and will at the same time afford a good test for determining the degree of definition of the radiogram of the impacted third molar. If the radiogram shows an overlap of the mesial surface of the third molar upon the distal surface of the second, and also shows at the contact point an overlap of the mesial surface of the second molar upon the distal surface of the first (Fig. 11 C, page 27), the radiogram will not be correct, and another should be made. The correct radiogram should not show at the contact point an overlap of the second molar upon the first, but, where there is a lingual or buccal deflection of the first or

second molar, this overlap is unavoidable in an occasional case, and the condition should be subsequently checked with the clinical findings. The radiogram should show definite enamel caps, pulp chambers and canals in the first, second and third molars, and no part of the occlusal surfaces of these teeth should be visible.

There are cases where there is an overlap, at the contact point, of the third molar upon the second and a part of the occlusal surface of the third molar is visible. This type of impaction is treated entirely differently from a buccal deflection and is termed a buccolingual deflection, described on page 70.

Where a radiogram shows a buccal deflection, the condition should, wherever possible, be checked with the clinical findings, and such a comparison can always be made where the crown is partially exposed. Where no part of the tooth is exposed, the comparison is made after the incision of the gum tissue in order to gain access to the crown. The operator should check the presence of a buccal deflection by instrumentation, if the ossistructure does not interfere, in order to verify the interpretation of the radiogram. If, however, the ossistructure does interfere, the probe is used after the necessary amount of structure has been excised to allow it to be inserted for exploration. If the presence of the overlap and the buccal deflection are verified, the next diagnostic point to be determined is whether the operator will have any difficulty in applying the exolever to the mesial surface of the third molar. If the conditions indicate that this surface is not accessible, it will be advisable to excise the ossistructure along the part of the crown that is deflected buccally out of alignment with the distobuccal surface of the second molar, which procedure is described in the various chapters on operative technic.

The procedure described is dependable where there is a buccal deflection, but the lingual radiogram will not show to what extent the tooth is deflected buccally, and it will be necessary to make an occlusal radiogram in order to obtain this information. The diagnostic point will then be of sufficient value to indicate the operative procedure, provided the radiograms have been correctly made.

Vertical Impaction.—In Fig. 46 are shown two types of the third molar impacted in a vertical position, where the buccal surface of the crown is out of alignment buccally with the corresponding surface of the second. The contact point of the first molar with the second in these two cases is studied to determine whether there is an overlap of the crown of the first molar upon the crown of the second, after which the two cases are studied to determine the overlap of the mesial surface of the third molar upon the distal surface of the second. The enamel cap and pulp chamber of the third molar, as in the case where

the tooth is in alignment, will be as distinct as they are in the other teeth. The occlusal surface will not, however, be observable in the radiogram and the location of the crown contact and deflection are studied as to their alignment with the occlusal surface of the second molar.

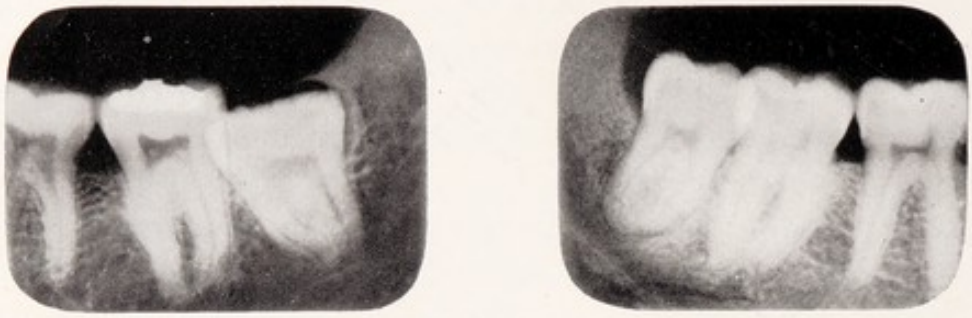


Fig. 46. — Crown Alignment — Buccal Deflection—Vertical Impaction. Vertical type of impacted mandibular third molar, with buccal surface of crown of third molar out of alignment buccally with corresponding surface of second.

Mesioangular Impaction.—In Fig. 47 are shown two types of the third molar impacted in a mesioangular position, where the buccal surface of the crown is out of alignment buccally with the corresponding surface of the second molar. The diagnostic points described above in the vertical type will apply also to this type. In some cases of this type of impaction it will be shown that a part of the occlusal surface, and in other cases a part of the mesial surface, of the third molar is in contact with and overlaps the distal surface of the second, and the location of the crown contact and deflection are studied as to their alignment with the occlusal surface of the second molar.

Distoangular Impaction.—In Fig. 48 are shown two types of the third molar impacted in a distoangular position, where the buccal surface of the crown is out of alignment buccally with the corresponding surface of the second. In these cases the mesial surface of the third molar is in contact with and overlaps the distal surface of the second, and the other diagnostic points are the same as those described above in the mesioangular type.

Fig. 47.—Crown Alignment—Buccal Deflection—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, with buccal surface of crown of third molar out of alignment buccally with corresponding surface of second.

Horizontal Impaction.—In Fig. 49 are shown two types of the third molar impacted in a horizontal position, where the buccal surface of the crown is out of alignment buccally with the corresponding surface of the second. The diagnostic points described above in the vertical, mesioangular and distoangular types will apply also to this type.

Fig. 48.—Crown Alignment—Buccal Deflection—Distoangular Impaction. Distoangular type of impacted mandibular third molar, with buccal surface of crown of third molar out of alignment buccally with corresponding surface of second.

The various positions of the crown are studied as to their alignment with the occlusal surface of the second molar, and the extent to which the occlusal surface of the third may be involved in its contact and overlap with the distal surface or distal root of the second molar should be noted.

Where the crown of the third molar is in a horizontal position, with the entire occlusal surface in contact with the distal surface of the second, the operator will find that in the majority of such cases the radiogram will show an overlap of the crown of the third molar upon the crown of the second, with part of the crown of the third molar deflected buccally out of alignment with the buccal surface of the second. Where, however, the occlusal surface of the third molar is not in contact with the distal surface of the second, there will be at least some space between the two teeth, and, if this space is not observable, there will be a buccal deflection of the third molar.

In a case of buccal deflection of an impacted third molar, with the tooth in a horizontal position and its entire occlusal surface in contact with the second below its gingival third, involving the greater part of

Fig. 49.—Crown Alignment—Buccal Deflection—Horizontal Impaction. Horizontal type of impacted mandibular third molar, with buccal surface of crown of third molar out of alignment buccally with corresponding surface of second.

the distal root of the second molar, the peridental membrane of the latter tooth should be carefully studied in the radiogram to determine whether there is an involvement of this membrane.

When the operator has learned to identify in the radiogram a buccal deflection of the crown of the third molar, he usually wants to know how to identify a case where the buccal surface of the third molar is deflected upon the lingual surface of the second; that is, he wants to be able to distinguish between the two kinds of overlaps that he presumes accompany respectively such deflections. It is, however, very rare that a case of this kind of deflection is found, and in the author's collection of thousands of cases there is only one specimen of such a deflection, a mesioangular impaction, which is shown in Fig. 50. It is difficult—in fact, it is practically impossible—to distinguish such a

Fig. 50.—Crown Alignment—Exceptional Case—Mesioangular Impaction. An exceptional case of impacted mandibular third molar where buccal surface is in contact with lingual surface of second molar, a condition that can be determined only by a clinical examination or an occlusal radiogram.

deflection in a lingual radiogram, although a deflection of this character, when present, can be readily recognized in a clinical examination or in an occlusal radiogram.

If, in the case of a deflection, the radiogram has been improperly made, and it will be inconvenient for the patient to have another made, the operator can check the amount of overlap of the first molar upon the second and compare it with the overlap upon the third molar. By this comparison the operator can determine approximately the character of the deflection.

Where the first molar is missing, the operator will have no guide by which to determine whether there is an overlap at the contact point of the first and second molars. If, however, the radiogram is correctly made, the overlap upon the third molar will be shown. A guide will not, therefore, be always necessary, as the case can, in the majority of instances, be checked with the clinical findings or with an occlusal radiogram. Where the second molar is missing, the operator must depend on the clinical examination.

In addition to the foregoing interpretation of a buccal deflection, an occlusal radiogram may be used to check the condition.

QUESTIONABLE BUCCAL DEFLECTION

In an occasional case of vertical or mesioangular impaction, where the greater part of the mesial surface of the crown of the third molar is in contact with the distal surface of the second at the gingival third of the latter tooth, the mesial surface will not cast a shadow upon the distobuccal surface of the distal root of the second molar to show a buccal deflection, and no dependence can be placed on the diagnostic value of the lingual radiogram to show the character of the deflection It is not unusual in such a case to find a part of the occlusal surface of the third molar presented to view, and the conditions may be interpreted as a slight lingual deflection when, as a matter of fact, it is a buccal deflection. An occlusal radiogram is made in such a case to determine whether the deflection is lingual or buccal, and usually it is a slight buccal deflection.

Fig. 51.—Crown Alignment—Mesioangular Impaction. Two lingual radiograms where it is difficult to determine whether there is a buccal deflection. This condition can be satisfactorily determined only from an occlusal radiogram.

In Fig. 51 are shown two lingual radiograms of a mesioangular impaction where the greater part of the mesial surface of the third molar is at the gingival third of the second, and the operator will not be able to determine whether there is a buccal deflection.

CONTACT OF ROOTS PREVENTS VISIBILITY OF BUCCAL DEFLECTION

Where, in a vertical or distoangular impaction, the mesial surface of the mesial root of the third molar is in contact with the distal surface of the distal root of the second, the resulting pressure will deflect the mesial surface of the third molar to a slight extent distally, and the shadow of the third molar that would be cast upon the distobuccal surface of the second will not be shown in a lingual radiogram. Where this condition exists, a definition of a buccal deflection can be obtained only by the clinical findings and by an occlusal radiogram.

In Fig. 290 A, page 246, is shown a lingual radiogram of a case of this character, and the contact of the roots, together with the deflection of the mesial surface of the third molar, can be noted, but the

buccal deflection of the crown cannot be determined. In Fig. 290 B, page 246, is shown an occlusal radiogram of the case, where the buccal deflection of the crown of the third molar can be definitely determined.

BUCCAL DEFLECTION RESULT OF LINGUAL DEFLECTION OF THE SECOND MOLAR

Where the crown of the second molar is deflected lingually, a part of the crown of the third molar will often be deflected buccally out of alignment with the distobuccal surface of the second molar as the result of the lingual deflection of that tooth. This condition is as favorable for the operative technic as a typical buccal deflection, and will permit excision of the ossistructure along that part of the mesial or occlusal surface of the crown of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second, at the same time allowing the application of the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar.

BUCCAL DEFLECTION RESULT OF LARGE CROWN

Where the crown of the third molar is larger than the crown of the second, or where the occlusal or mesial surface of the third molar is of greater width than the distal surface or distal root of the second, a part of the mesial surface of the crown of the third molar will extend buccally out of alignment with the buccal surface of the second, and this condition is in the nature of a buccal deflection. A condition of this character should be determined by the clinical examination and interpretation of an occlusal radiogram, and the exolever may be applied to that part of the mesial surface of the crown of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second, the ossistructure being utilized anterior to or below this surface as a fulcrum, thereby avoiding the use of the second molar for this purpose.

Where the entire tooth is covered by gum tissue, or where the ossistructure extends over the greater part of the tooth, a clinical examination cannot be made without extensive explorative investigation, and an occlusal radiogram should be made in addition to a lingual radiogram, as the true condition cannot be determined by the latter alone.

For the purpose of describing conveniently the technic where the buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second, the condition will be designated in a vertical, mesioangular, distoangular or horizontal impaction as a case where there is a buccal deflection.

LINGUAL DEFLECTION

Where the buccal surface of the crown of the third molar is deflected lingually out of alignment with the corresponding surface of the second, the deflection will have a tendency to direct the occlusal surface of the third molar toward the lingual side of the arch, in one of the degrees of variation that may occur, to a point where the entire occlusal surface will be toward the lingual side of the arch and the roots will be in the opposite direction, while the position of the tooth will be horizontal. This horizontal position of the tooth is not, however, of that type of impaction described as a horizontal position of the crown where the occlusal surface of the third molar is in contact with the distal surface of the second. The number of cases of the latter type, compared with the usual cases in a horizontal position, is practically nil. Where the crown is deflected toward the lingual side of the arch, the crown will be discernible in the radiogram, and the degree of deflection can be approximately estimated by the position of the crown and the root formation. The deflection of the crown, when the radiogram has been correctly made, is interpreted by a comparative study of the first, second and third molars, and the most prominent diagnostic points of the deflected third molar are the enamel cap, pulp chamber, occlusal surface and root formation. Where the crown of the third molar is not deflected, no part of its occlusal surface will be shown in the radiogram, but, where the crown is deflected lingually, the occlusal surface will be visible to the extent of the lingual deflection, provided, as previously stated, the radiogram is correctly made, in which case it should definitely show the enamel caps, pulp chambers and pulp canals of the first and second molars to be in their approximately normal positions, which teeth should always be studied in conjunction with the deflected crown.

The farther the buccal surface of the crown of the third molar is deflected lingually from its alignment with the corresponding surface of the second, the more definitely will the occlusal surface of the third molar be outlined in the radiogram. The farther the crown of the third molar is deflected lingually from its approximately normal position, the less root formation will be seen compared with the roots of the second molar, and, when only the occlusal surface of the third molar is seen in the radiogram, no roots will be visible. When the roots are foreshortened or not visible, it is imperative that another radiogram be made to determine the character of the roots, so that an exolever technic can be applied in conformity with the root formation.

A complete lingual deflection presents an operative procedure that has been greatly simplified by the introduction of the exolever technic. Formerly, where a forceps technic was followed, a lingual deflection

presented a difficult procedure, as the crown was almost inaccessible to the proper application of the forceps, and, even when the forceps were adjusted, the extraction movements could not be executed in conformity with the root formation. An exolever technic, however, obviates the use of forceps, and the operator should take advantage of the lingual deflection of the crown to direct the tooth lingually with the exolever after the ossistructure has been excised and the extraction movements have been made in accordance with the formation of the roots.

Cases of impaction where the crown of the third molar is deflected only to a slight extent lingually, compared with those cases where the crown is markedly deflected, are in the majority, and are described respectively in the chapters pertaining to vertical, mesioangular, distoangular and horizontal impactions. When the tooth verges beyond a slight lingual deflection, it assumes an angular position, as described under the heading pertaining to linguoangular impaction (page 77), and, where the crown is deflected lingually to such an extent that its entire occlusal surface is on the lingual side of the arch, it will be considered a complete lingual deflection, which is described under that heading (page 80).

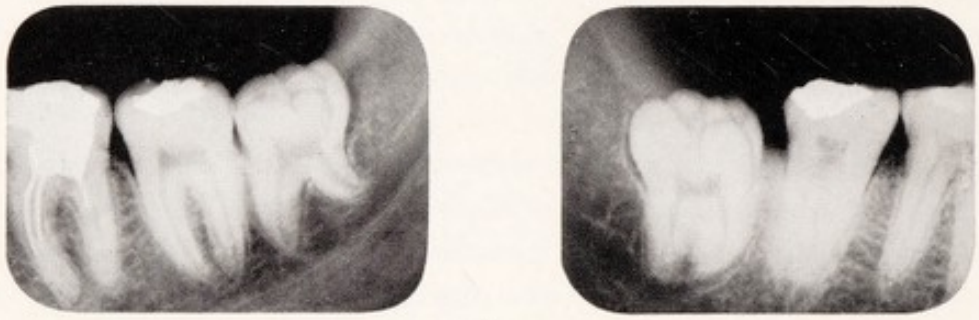


Fig. 52.—Crown Alignment—Lingual Deflection—Vertical Impaction. Vertical type of impacted mandibular third molar, with buccal surface of crown deflected to a slight extent lingually out of alignment with corresponding surface of second molar.

Vertical Impaction.—In Fig. 52 are shown two types of the third molar impacted in a vertical position, where the buccal surface of the crown of the third molar is deflected to a slight extent lingually out of alignment with the corresponding surface of the second. The degree of deflection varies in these two cases, but the deflection in any one of them is not sufficient to show a foreshortening of the roots, and only the lingual cusp and a small part of the occlusal surface are seen in the radiogram. The deflection is, however, of sufficient importance to be considered, and should be recognized in the radiogram, as the operative technic to be followed must conform to the character of the deflection. In these two cases the first and second molars are in an approximately normal position, presenting definite enamel caps, pulp chambers

and pulp canals, and the third molar shows prominently a small part of the occlusal surface and a part of the lingual cusp.

Mesioangular Impaction.—In Fig. 53 are shown two types of the third molar impacted in a mesioangular position, where the buccal surface of the crown of the third molar is deflected to a slight extent lingually out of alignment with the corresponding surface of the second. In these two cases the first and second molars are in approximately normal position, presenting definite enamel caps, pulp chambers and pulp canals, and the third molar shows prominently a small part of the occlusal surface and a part of the lingual cusp. In some of the cases the sulci of the occlusal surface can be seen. There is a variation in these cases in the extent of the deflection, and the character of the deflection should be compared with the crown of the second molar.

Fig. 53.—Crown Alignment—Lingual Deflection—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, with buccal surface of crown deflected to a slight extent lingually out of alignment with corresponding surface of second.

Distoangular Impaction.—In Fig. 54 are shown two types of the third molar impacted in a distoangular position, where the buccal surface of the crown of the third molar is deflected to a slight extent lingually out of alignment with the corresponding surface of the second. In these two cases the first and second molars are in approximately normal position, presenting definite enamel caps, pulp chambers and pulp canals, and the crown of the third molar shows prominently a small part of the occlusal surface and a part of the lingual cusp. A

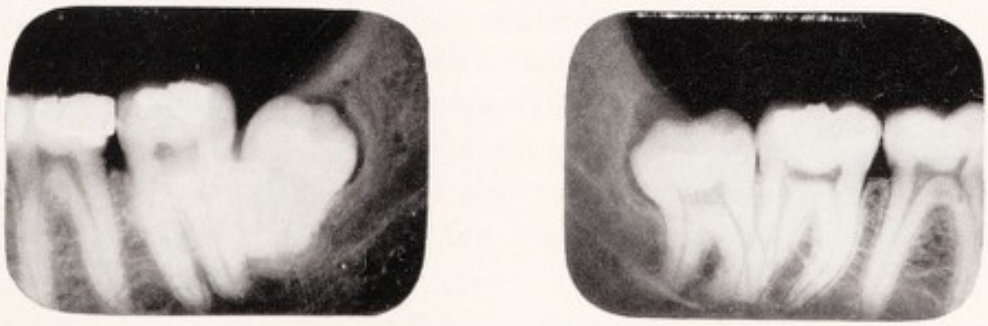


Fig. 54.—Crown Alignment—Lingual Deflection—Distoangular Impaction. Distoangular type of impacted mandibular third molar, with buccal surface of crown deflected to a slight extent lingually out of alignment with corresponding surface of second molar.

study of these two types is made to note the lingual deflection of the crown of the third molar compared with the crown of the second.

Horizontal Impaction.—In Fig. 55 are shown two types of the third molar impacted in a horizontal position, where the buccal surface of the crown of the third molar is deflected to a slight extent lingually and out of alignment with the corresponding surface of the second. In these two cases the first and second molars are in approximately normal position, presenting definite enamel caps, pulp chambers and pulp canals, and the third molar shows prominently a small part of the occlusal surface and a part of the lingual cusp. There is a variation in these cases in the deflection of the crown of the third molar compared with the crown of the second.

For the purpose of describing conveniently the technic where the buccal surface of the crown of the third molar is slightly out of alignment lingually with the corresponding surface of the second, with the occlusal surface presented lingually, the condition will be designated in a vertical, mesioangular, distoangular or horizontal impaction as a case where there is a lingual deflection.

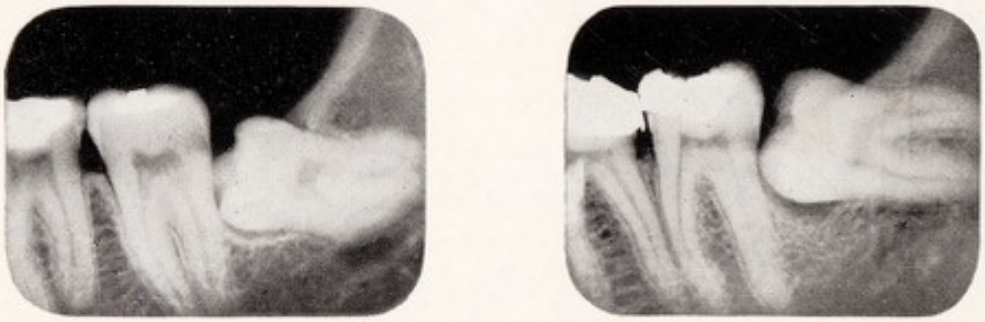


Fig. 55.—Crown Alignment—Lingual Deflection—Horizontal Impaction. Horizontal type of impacted mandibular third molar, with buccal surface of crown deflected to a slight extent lingually out of alignment with corresponding surface of second molar.

BUCCOLINGUAL DEFLECTION

Often, where the crown of the third molar is deflected lingually, its further progress in that direction is arrested by a part of the occlusal surface coming in contact with the distobuccal surface of the second. This condition presents a deflection of a compound character, and is termed a buccolingual deflection. This compound deflection has a tendency to complicate the extraction of the tooth, and should be recognized in the radiogram in advance of any operative procedure. The lingual deflection may be very slight, and will vary from this position to a moderate deflection in the vertical, mesioangular and in some horizontal types. In the latter types, where the occlusal surface of the third molar impinges upon the distal root of the second molar and the mesial surface of the third molar is below the superior border of the ossistructure, some extreme cases of deflection are found.

The rule in these cases is, however, that neither the buccal nor lingual deflection will be of an extreme nature, but, should either be present and not recognized in the radiogram, the result of the operative procedure will not be of a satisfactory character. There is a tendency of the third molar, after the excision of the ossistructure has been made and after the tooth has been directed distally with the exolever from its contact with the distobuccal surface of the second molar, to return to its original position when pressure is applied in a buccal application of the exolever for the final delivery of the tooth, and especially may this occur in a vertical or an angular impaction. If, during the pressure exerted by the buccal application, the operator does not observe this tendency of the tooth to return to its original position and he attempts to direct the tooth out of its socket with the exolever, the buccolingual deflection will interfere with the extraction movements. It will, therefore, be necessary to maintain the distal position of the crown while directing the tooth out of its socket. The diagnostic points are determined in the same manner as described in the case of a buccal deflection by a shadow cast, at the contact point of the third molar with the second, upon the distobuccal surface of the second molar and with no overlap of the contact point between the first and second molars. The lingual deflection of the crown is determined by the fact that a part of the occlusal surface is visible and the first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. This character of deflection should not be confused with a buccal deflection, as in the latter case the buccal surface of the third molar is out of alignment with the corresponding surface of the second molar, and this causes the occlusal and buccal surfaces of the third molar to be deflected buccally out of alignment with the distobuccal surface of the second and permits access to that part of the mesial surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second. Where there is a buccal deflection, part of the crown of the third molar is in contact with the distal surface of the crown or root of the second, and in a buccolingual deflection the crown of the third molar is in contact with the distobuccal surface of the crown or root of the second. In a buccolingual deflection the buccal surface of the crown of the third molar is out of alignment at an angle buccally with the distobuccal surface of the second, the occlusal surface is deflected lingually and a part of the surface is in close contact with the distobuccal surface of the second molar. No direct access can be obtained to the occlusal surface of the third molar, which is in contact with the distobuccal surface of the second, such as can be obtained in the case of a buccal deflection.

Vertical Impaction.—In Fig. 56 are shown two types of the third molar impacted in a vertical position, where the occlusal surface of the crown is deflected lingually, and the buccal surface of the crown is buccally out of alignment with the distobuccal surface of the second molar. As a rule, the superior border of the ossistructure in this type of a case is beyond the gingival third of the tooth. If a forceps technic were to be followed in such a case, the prevailing condition would have a tendency to prevent the execution of the technic, as the superior border of the ossistructure is so located as to limit the application of the beaks of the forceps to the buccal and lingual surfaces without excision, and the buccolingual deflection of the crown will prevent any lingual movement. A careful study should be made of these two cases of compound deflection in order to understand thoroughly the character of such a deflection.

Fig. 56.—Crown Alignment — Buccolingual Deflection — Vertical Impaction. Vertical type of impacted mandibular third molar, where occlusal surface of crown is deflected to a slight extent lingually, and buccal surface of crown is deflected buccally out of alignment with distobuccal surface of second molar.

Mesioangular Impaction.—In Fig. 57 are shown two types of the third molar impacted in a mesioangular position, where the occlusal surface of the tooth is deflected lingually, and a part of its occlusal surface is in contact with the distobuccal surface of the second molar, with the buccal surface of the crown deflected buccally out of alignment with the distobuccal surface of the second molar. These two cases show variation in the extent of the lingual and buccal deflections of the crown, variation in the location of the contact of the third

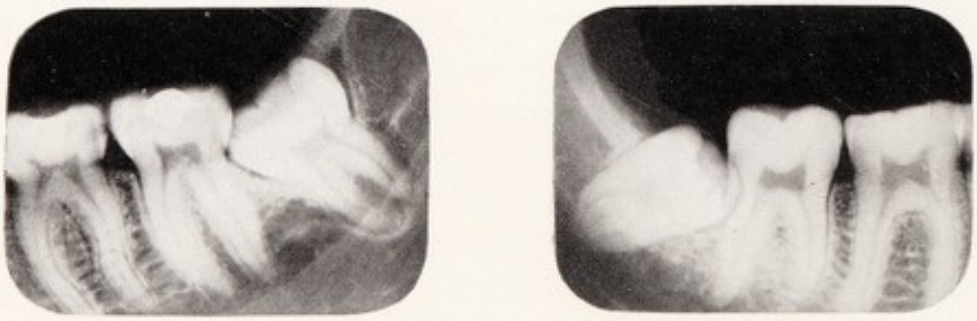


Fig. 57.—Crown Alignment—Buccolingual Deflection—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, where occlusal surface of crown is deflected to a slight extent lingually, and buccal surface of crown is deflected buccally out of alignment with distobuccal surface of second molar.

molar with the second molar and variation in the relation of the deflected crown to the superior border of the ossistructure.

Distoangular Impaction.—A buccolingual deflection in a distoangular impaction would be an extremely rare occurrence, and, in the thousands of cases that have come under the observation of the author, no case of this kind has been seen. Cases may occur where an incorrectly made radiogram has the appearance of presenting a buccolingual deflection in a distoangular impaction, but, if the radiogram has been correctly made, in all probability no such deflection would be shown.

Horizontal Impaction.—In Fig. 58 are shown two types of the third molar impacted in a horizontal position, where the occlusal surface of the crown is deflected lingually, a part of that surface being in contact with the distobuccal surface of the second molar, and the buccal surface of the crown being deflected buccally out of alignment with the distobuccal surface of the second molar. These two cases show variation in the extent of the lingual and buccal deflections of the crown, variation in the location of the contact of the third molar with the second and variation in the location of the superior border of the ossistructure.

For the purpose of describing conveniently the technic where the buccal surface of the crown of the third molar is out of alignment buccally with the distobuccal surface of the second and the occlusal surface is directed lingually, the condition will be designated in a vertical, mesioangular or horizontal impaction as a case where there is a buccolingual deflection.

Fig. 58.—Crown Alignment—Buccolingual Deflection—Horizontal Impaction. Horizontal type of impacted mandibular third molar, where occlusal surface of crown is deflected to a slight extent lingually, and buccal surface of crown is deflected buccally out of alignment with distobuccal surface of second molar.

TORSIONAL DEFLECTION

The crown of an impacted third molar may, in an occasional case, be in a torsional position. It is fortunate that the crown in such a position is not often found, for the condition will tend to complicate the extraction, as the position of the roots and septum will increase the difficulty of overcoming the resistance when the extraction movements are executed.

The torsion is interpreted in the radiogram by the crown and root formation and by a comparative study of the enamel cap, pulp chamber and root formation of the third molar with the enamel cap, pulp chamber and root formation of the second. The root formation has the appearance of fused roots in some cases, and in other cases it resembles an extra root. The pulp chamber is very small, or it may be entirely obliterated, and the pulp canals may be outlined in some cases, but they are usually also obliterated. The crown, in addition to being in a torsional position, may be in alignment with the second molar and not deflected in its relation to the second molar, or it may be deflected buccally, lingually or buccolingually.

Fig. 59.—Torsional Position—Vertical Impaction. An enlarged radiogram of vertical type of impacted mandibular third molar in a torsional position. The occlusal surface, pulp chamber, pulp canals and root formation of third molar should be compared with corresponding anatomic structures of second.

In Fig. 59 is shown an enlarged radiogram of the vertical type of impacted third molar in a torsional position, which should be studied as described in the preceding paragraph.

In Fig. 60 are shown three illustrations of the third molar made from a dry mandible. In Fig. 60 A the third molar, which has been placed in an empty socket and is not in a torsional position, presents a definitely outlined pulp chamber, pulp canals and bifurcated roots that would normally have a large septum between them. In Fig. 60 B the tooth is presented as being turned in its socket to a point where the bifurcation and the buccal surface are in the position of the surface

that would normally be the distal surface, and the illustration shows the roots as if they were fused, with a slight tracing of a line indicating that there are two roots.

A comparison of the root formation in Figs. 60 A and 60 B will show the character of the torsion. The pulp chamber in Fig. 60 B is very small, and has not the natural appearance of the pulp chamber in Fig. 60 A. In Fig. 60 C is shown the same tooth with the bifurcation and buccal surface located in the position of the surface that would normally be the mesial surface.

A torsion of the third molar is an important diagnostic point to be determined in the radiogram, and, if present, indicates that the blade

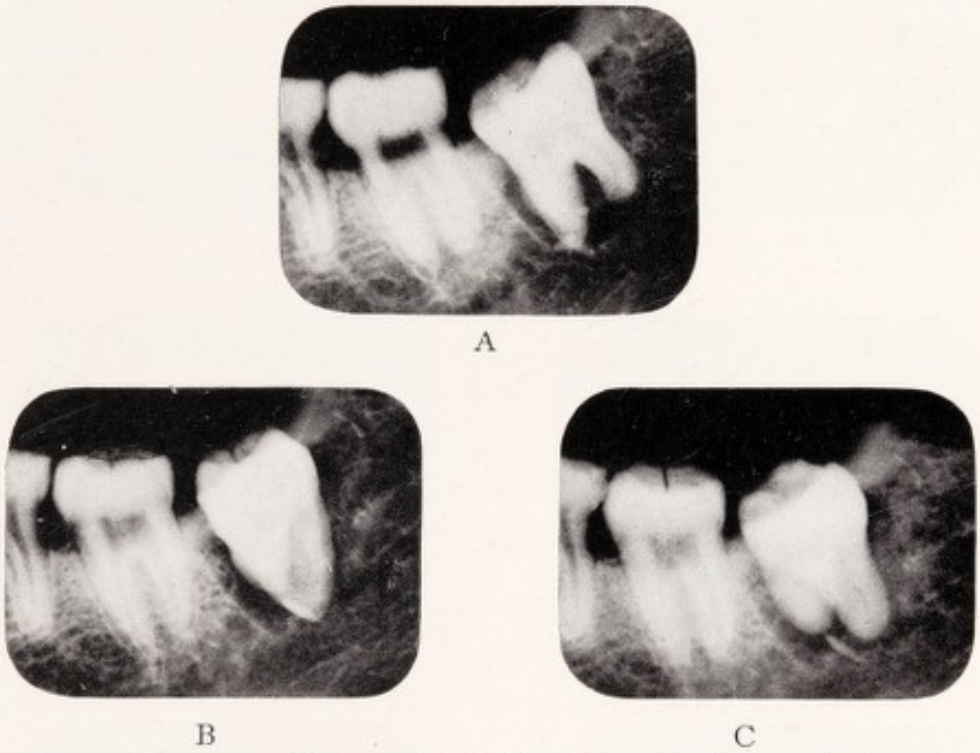


Fig. 60.—Torsion of Crown. Mandibular third molar in a torsional position. *A*, mandibular third molar, with definitely outlined pulp chamber, pulp canals and two bifurcated roots; *B*, tooth turned in its socket to a point where bifurcation and buccal surface are in position of surface that would normally be distal; *C*, tooth with bifurcation and buccal surface in position of surface that would normally be mesial.

of the exolever cannot be successfully applied to the buccal surface, in the case of a vertical or an angular impaction, where the bifurcation would normally be if the tooth were not in a torsional position, and the bifurcation is either mesial or distal to its approximately normal position. Where a part of the crown is exposed, a torsion may be determined clinically and checked with the radiographic interpretation. Making a diagnosis of a torsion of the tooth in advance of any operative procedure will be the means of decreasing trauma and eliminating all guesswork by avoiding any improper application of the instrument in a case where a buccal application of the exolever is indicated.

Fig. 61.—Torsional Position—Vertical Impaction. Vertical type of impacted mandibular third molar, with crown in various torsional positions.

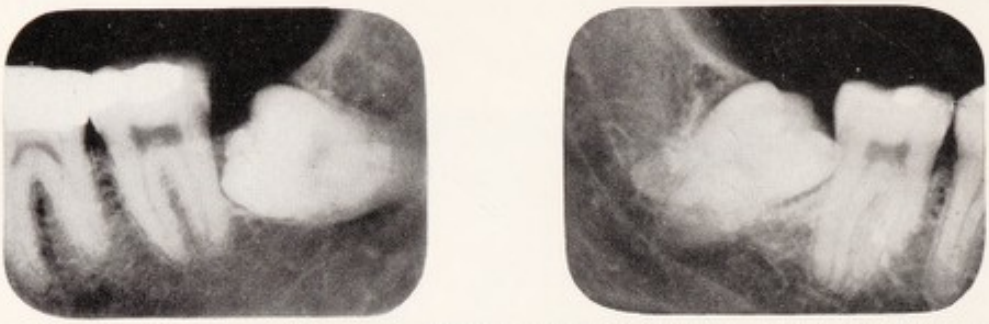


Fig. 62.—Torsional Position—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, with crown in various torsional positions.

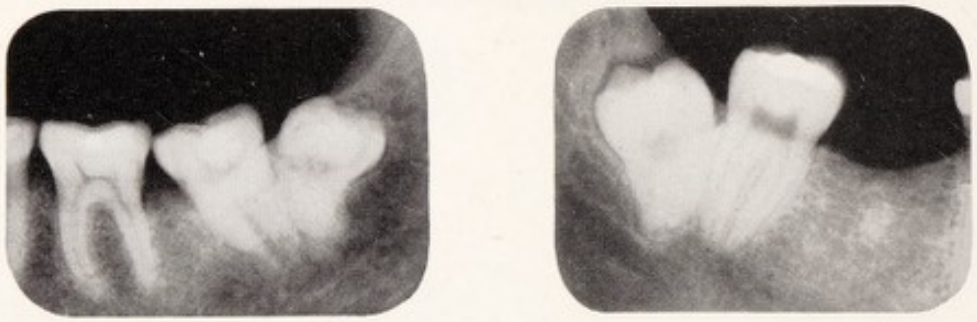


Fig. 63.—Torsional Position—Distoangular Impaction. Distoangular type of impacted mandibular third molar, with crown in various torsional positions.

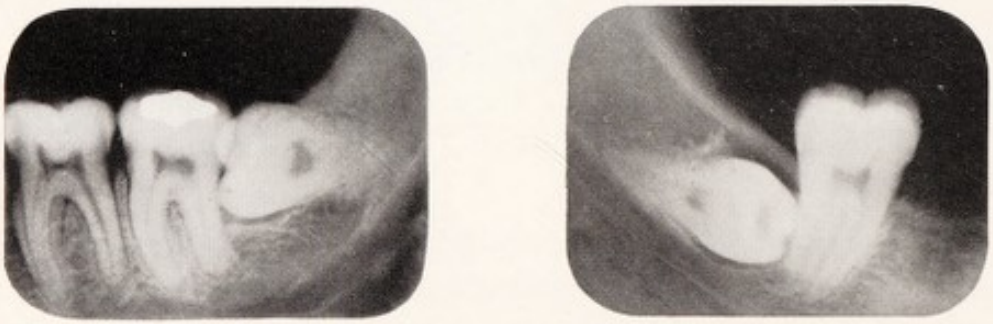


Fig. 64.—Torsional Position—Horizontal Impaction. Horizontal type of impacted mandibular third molar, with crown in various torsional positions.

In Fig. 61 are shown two types of vertical impaction; in Fig. 62 are shown two types of mesioangular impaction; in Fig. 63 are shown two types of distoangular impaction, and in Fig. 64 are shown two types of horizontal impaction, in which cases the tooth is in a torsional position. There is a variation in the position of the crown in these cases,

and an analysis should be made of the diagnostic points presented in each case.

For the purpose of describing conveniently the technic where there is a torsion of the third molar, the condition will be designated in a vertical, mesioangular, distoangular or horizontal impaction as a torsional deflection.

UNUSUAL POSITION

The four principal positions in which a third molar may be impacted have been described as vertical, mesioangular, distoangular and horizontal, with variation in their alignments. There are other slight or even marked variations from these four positions in which an impacted third molar may be found, but these other variations are so seldom seen that to include them in a main classification would be confusing and render an intelligent description more difficult. On rare occasions a linguoangular impaction, a buccoangular impaction or a complete lingual impaction, or sometimes an impaction that may be termed an anomaly or "freak" case is presented.

Linguoangular Deflection.—Where the deflection of the buccal surface of the crown of the third molar is markedly lingual, the tooth will assume a linguoangular position, and the radiogram, if correctly made, will show the roots of the third molar foreshortened compared with the roots of the second, with a greater part of its occlusal surface visible. The first and second molars show definite enamel caps, pulp chambers and pulp canals, but no part of the occlusal surfaces is visible and there is no overlap at the contact points of these teeth. Where such a condition is presented, another radiogram is made for the purpose of showing the root formation more definitely, which procedure is more fully described in "Radiographic Technic" (page 19). Briefly stated, the film is placed in the mouth in the same position as that occupied by the first film inserted in the standardized position, which showed a foreshortening of the roots, but the cone of the x-ray machine for the second radiogram is directed downward at an acute angle as when making a radiogram of a maxillary first molar, this having the effect of showing more definitely the root formation in this type of deflection. The roots will, however, be elongated by this procedure, but this condition will not prove disadvantageous.

In Fig. 65 are shown two types of this kind of impaction, presented together for better comparison. In Figs. 65 A and 65 C are shown the foreshortened effect of the roots, with a greater part of the occlusal surface visible; the first and second molars show definite enamel caps, pulp chambers and pulp canals, but no part of the occlusal surface is visible and there is no overlap at the contact points of these two teeth.

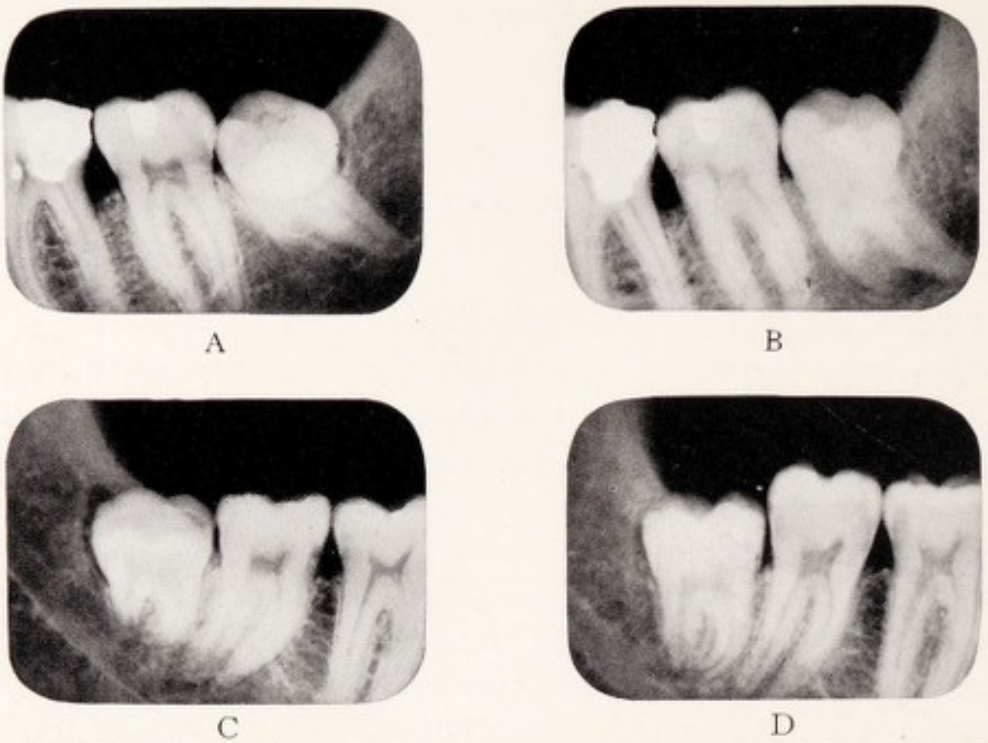


Fig. 65.—Crown Alignment—Linguoangular Impaction. Two cases of linguoangular type of impacted mandibular third molar in various degrees of deflection. *A* and *C*, roots foreshortened, with greater part of occlusal surface of third molar visible; *B* and *D*, which were subsequently made, root formation detailed.

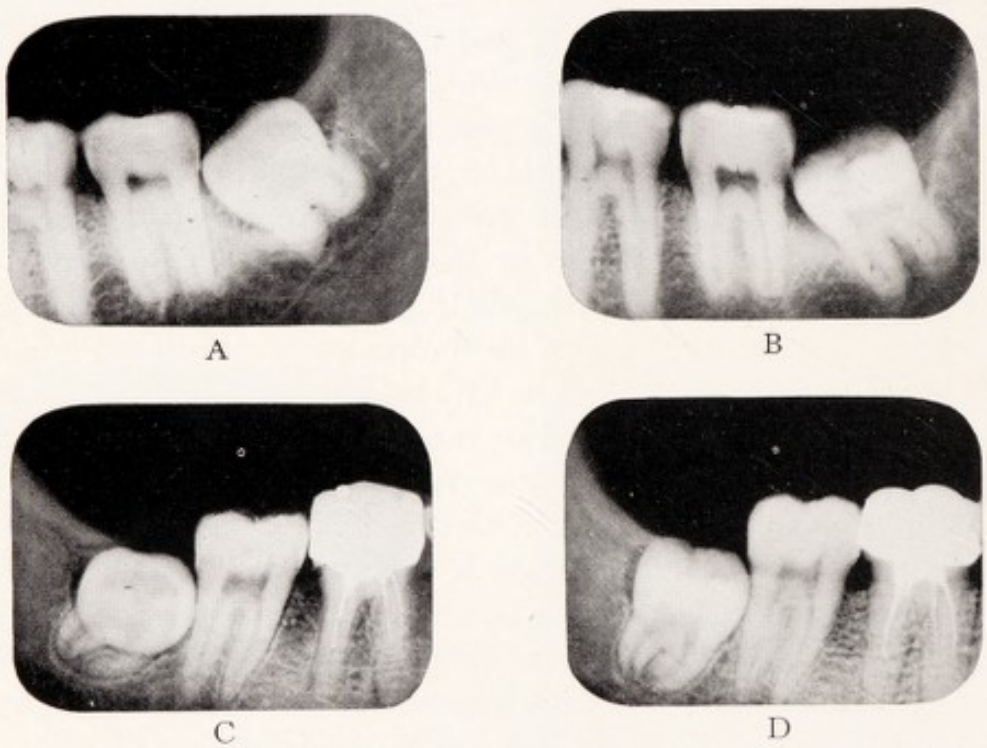


Fig. 66.—Crown Alignment—Linguoangular Impaction. Two cases of linguoangular type of impacted mandibular third molar in various degrees of deflection. *A* and *C*, roots foreshortened, with greater part of occlusal surface of third molar visible; *B* and *D*, which were subsequently made, root formation detailed.

In Figs. 65 B and 65 D, which radiograms were subsequently made of the previous cases, are shown the roots definitely outlined as if the method of making the previous radiograms had been corrected. The

elongated root effect will, however, occur in all cases where the method of making the radiogram mentioned above is followed. The visibility of the greater part of the occlusal surface and the foreshortening of the roots are the diagnostic points for determining a linguoangular deflection of the third molar.

In Fig. 66 are shown two types of the third molar impacted in a linguoangular position and inclined mesially, with the crown markedly deflected lingually compared to the buccal surface of the second molar. In Figs. 66 A and 66 C are shown the first radiograms made, which present the foreshortened effect of the roots, with a greater part of the occlusal surface visible. The first and second molars show definite enamel caps, pulp chambers and pulp canals, but no part of the occlusal surfaces is visible and there is no overlap at the contact points of these two teeth. In Figs. 66 B and 66 D, which radiograms were subsequently made of the previous cases, are shown the elongated effect of the roots.

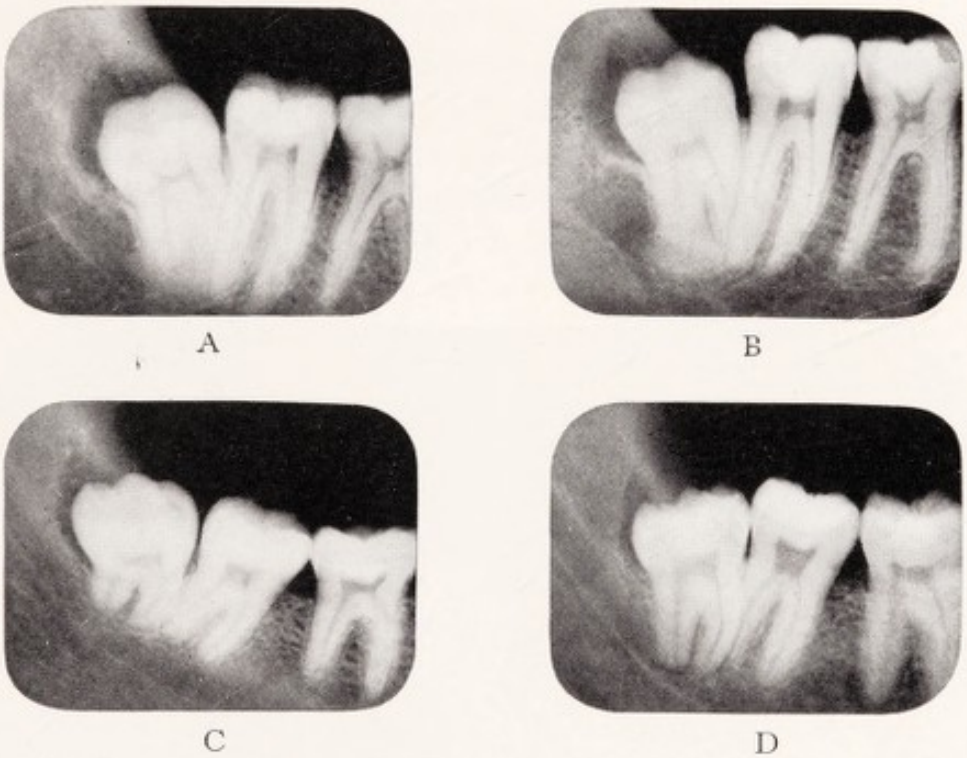


Fig. 67.—Crown Alignment—Linguoangular Impaction. Two cases of linguoangular type of impacted mandibular third molar in various degrees of deflection. *A* and *C*, roots foreshortened, with greater part of occlusal surface of third molar visible; *B* and *D*, which were subsequently made, root formation detailed.

In Fig. 67 are shown two types of the third molar impacted in a linguoangular position and deflected distally, with the crown markedly deflected lingually compared with the buccal surface of the second molar. In Figs. 67 A and 67 C are shown the first radiograms made, which present a foreshortened effect of the roots, with a greater part of the occlusal surface visible. The first and second molars show

definite enamel caps, pulp chambers and pulp canals, but no part of the occlusal surfaces is visible and there is no overlap at the contact points of these two teeth. In Figs. 67 B and 67 D, which radiograms were subsequently made of the previous cases, are shown the elongated effect of the roots.

Buccoangular Deflection.—On a rare occasion a buccoangular deflection may be found, and the condition will not be distinguishable in the radiogram from a linguoangular deflection, but clinical examinations have shown that in the majority of cases it will be a linguoangular deflection. A linguoangular deflection can be determined by a clinical or digital examination by palpating the area over the crown as a means of checking the radiogram, as the occlusal surface can usually be determined by the pronounced bulge at that point; but, when the tooth is completely deflected lingually, the deflection cannot be determined by palpation. When a buccoangular deflection is present, which condition can be determined only by an occlusal radiogram, no dependence can be placed on the clinical findings until the gum tissue has been incised and the crown exposed. In Fig. 327 A, page 275, is shown a lingual radiogram of a case of this character, and in Fig. 327 B is shown an occlusal radiogram of the same case where the buccoangular deflection of the third molar can be definitely determined.

Complete Lingual Deflection.—Formerly, before the introduction of the present method of making radiograms, a complete lingual deflec-

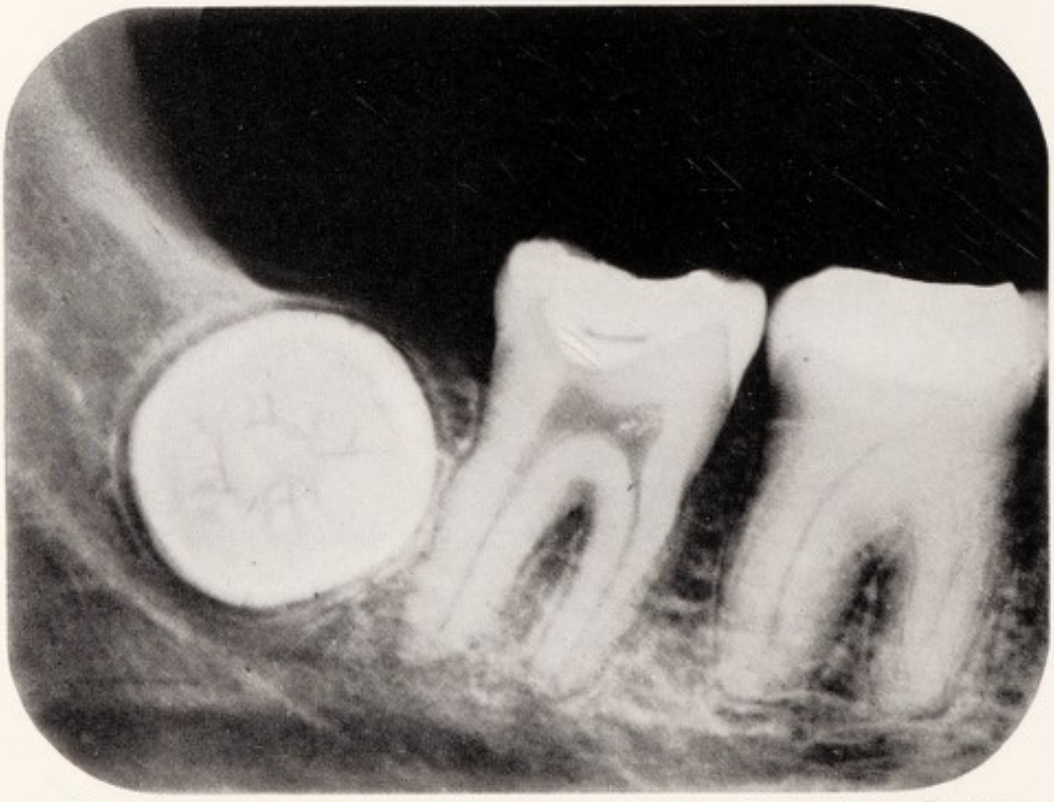


Fig. 68.—Crown Alignment—Complete Lingual Deflection. Enlarged radiogram of an impacted mandibular third molar, showing a complete lingual deflection, where occlusal surface resembles a disk and no root formation is shown.

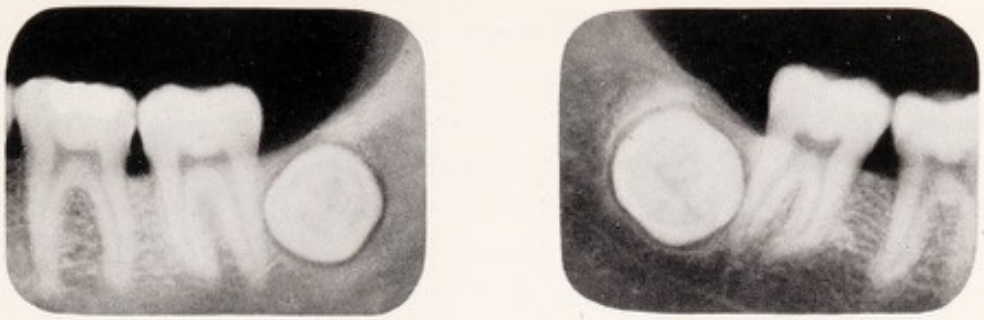
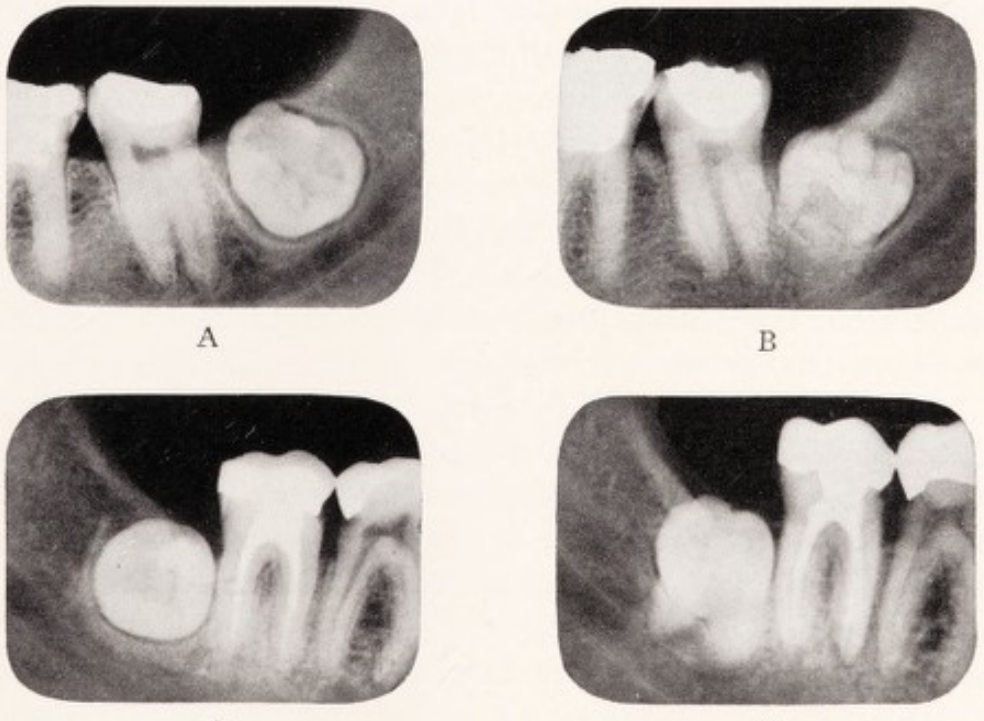


Fig. 69.—Crown Alignment—Complete Lingual Deflection. Impacted mandibular third molar, showing a complete lingual deflection, where occlusal surface resembles a disk and no root formation is shown.

tion of the crown of an impacted third molar, as shown in the enlarged radiogram (Fig. 68), could be recognized only after the gum tissue had been incised and the crown laid bare with a retractor for a clinical examination, when a part of the buccal surface was presented instead of the occlusal, mesial or distal surface, and even then it was difficult to determine which part of the crown was exposed to view. Where the entire buccal surface was covered by ossistructure, no diagnosis of the condition could be made until an extensive excision of the ossistructure had been executed.

If a complete lingual deflection is present, a radiogram will show such a condition, provided it has been made according to the radiographic technic described (page 12), when the occlusal surface will



A B C D

Fig. 70.—Crown Alignment—Complete Lingual Deflection. Two cases of impacted mandibular third molar, showing a complete lingual deflection. *A* and *C*, occlusal surface resembles a disk; *B* and *D*, which were subsequently made, root formation is shown.

resemble a disk, and no part of the root formation will be shown, as seen in Fig. 69, where two cases of this character are presented. The first and second molars show definite enamel caps, pulp chambers and pulp canals, but no part of the occlusal surfaces is visible and there is no overlap at the contact points of these two teeth. In such a case another radiogram is made for the purpose of showing a part of the root formation. A film is placed in the mouth in the same position as that occupied by the previous film that showed the occlusal surface as a disk, but the cone of the x-ray machine is directed downward at the same angle as when making a radiogram of a maxillary first molar, and this will have the effect, in some cases, of disclosing a part of the root formation, as shown in Fig. 70, where two cases of this kind are presented. In Figs. 70 A and 70 C are shown the disk effect of the crown as obtained in the first radiograms, and in Figs. 70 B and 70 D, which were subsequently made of the previous cases, are shown the formation of the roots.

Where the buccal surface of the crown of the third molar is deflected lingually out of alignment with the corresponding surface of the second, the farther the tooth is deflected in that direction the farther will the occlusal surface, as the result of this deflection, be directed toward the lingual side of the arch. In a complete lingual deflection of this character the entire occlusal surface of the third molar will be on the lingual side of the arch, with the roots directed buccally and the tooth in a horizontal position. The author has not, in his many years of experience, found a case of reversed condition; that is, where the entire occlusal surface is on the buccal side of the arch, with the roots directed lingually and the tooth in a horizontal position. Should a case of reversed condition be found, the question would involve the method of determining the difference between the two conditions. It was discovered, when investigating a complete lingual deflection, that, when the radiogram is made of the tooth in this position, the tooth has the appearance of a disk. When the tooth is reversed and a radiogram is made of the case, the same disk effect is obtained. When the second radiogram of a complete lingual deflection is made, the roots will be shown directed downward, whereas, if the second radiogram is made in the same manner as in the case in which the entire crown is directed buccally, the roots will have an upward presentation.

Anomalous Deflection.—On a rare occasion an impaction may be seen that can be characterized as an anomaly or "freak" case. An operator may have a case of this kind the first time he has occasion to make a radiogram, and he may not see a similar case during the remainder of his practice.

In Fig. 71 are shown two cases of this type of impaction presented together for better comparison. Cases of teeth in supposed anomalous positions are frequently presented in radiograms, but it was found that the radiograms of these cases were incorrectly made, and, if these radiograms had been correctly made, they would not appear as anomalous cases. In Fig. 71 A the crown is at the apical third of the second molar, with the tooth almost inverted. In Fig. 71 B the tooth is entirely inverted; that is, the crown is directed downward and the roots upward.

A B

Fig. 71.—Crown Alignment—Impacted Mandibular Third Molar—Inverted Position. Impacted mandibular third molar in an inverted position, which is rarely seen. *A*, tooth almost inverted; *B*, tooth entirely inverted.

CROWN WITH THE MESIAL SURFACE ACCESSIBLE

The operative technic for the extraction of the third molar should conform, as far as possible, to the application of the exolever that can be made to the crown, as the part of the tooth usually engaged by the exolever is either the mesial, mesiobuccal or buccal surface. When studying the radiogram, these surfaces should be carefully observed to determine whether the exolever can be applied without preliminary excision of the ossistructure. There are some cases where the exolever can be adjusted without preliminary excision of the ossistructure, and other cases where excision of the ossistructure is necessary in order to adjust the exolever. The decision to excise the ossistructure can be made from the radiogram, and such excision is made in advance of the application of the exolever.

Vertical Impaction.—In Fig. 72 are shown two types of the third molar impacted in a vertical position where the mesial surface of the crown is accessible to the immediate application of the exolever. In these two cases the mesial surface of the third molar, in its relation to the distal surface of the second molar and to the ossistructure at the superior border, is studied to determine the extent of surface available for the application of the exolever without interference from the second molar or the interseptum between the second and third molars.

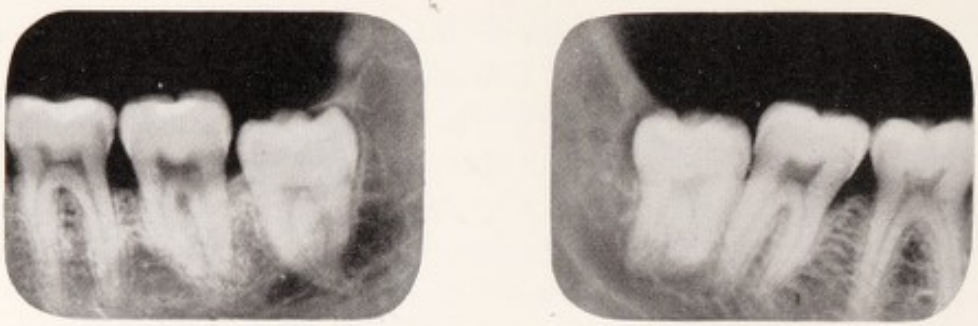


Fig. 72.—Mesial Surface Accessible—Vertical Impaction. Vertical type of impacted mandibular third molar, where mesial surface is accessible to immediate application of exolever.

Fig. 73.—Mesial Surface Accessible—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar where mesial surface is accessible to immediate application of exolever.

Fig. 74.—Mesial Surface Accessible—Distoangular Impaction. Distoangular type of impacted mandibular third molar where mesial surface is accessible to immediate application of exolever.

Mesioangular Impaction.—In Fig. 73 are shown two types of the third molar impacted in a mesioangular position where the mesial surface of the crown is accessible to the immediate application of the exolever. The distal surface of the second molar, the interseptum between the second and third molars and the pathologic condition involving the ossistructure between the gingival third of the second molar and the mesial surface of the third are studied to determine the access to the mesial surface of the third molar.

Distoangular Impaction.—In Fig. 74 are shown two types of the third molar impacted in a distoangular position where a careful study is necessary to determine whether access to the mesial surface of the crown can be obtained without preliminary excision of the ossistructure. There is a variation in the location of the mesial surface of the third

molar in its relation to the distal surface of the second, as the size of the space between these teeth varies in the different cases. The mesial surface of the third molar from the occlusal surface to the superior border of the ossistructure is studied, and a comparison is made of the mesial surface of the third molar with the distal surface of the second.

Fig. 75.—Mesial Surface Accessible—Horizontal Impaction. Horizontal type of impacted mandibular third molar where mesial surface is accessible to immediate application of exolever.

Horizontal Impaction.—In Fig. 75 are shown two types of the third molar impacted in a horizontal position where the mesial surface of the crown is accessible to the immediate application of the exolever. The occlusal surface and ossistructure below the mesial surface, the distal surface of the second molar and the superior border of the ossistructure are studied to determine the access to the mesial surface of the third molar.

CROWN WITH THE MESIAL SURFACE INACCESSIBLE

Vertical Impaction.—In Fig. 76 are shown two types of the third molar impacted in a vertical position where the mesial surface of the crown is inaccessible to the immediate application of the exolever. As the superior border of the ossistructure interferes with the application of the exolever, the ossistructure on the mesial surface is determined, as it must be excised in order to obtain access with an exolever. In the majority of vertical impactions a part of the mesial surface is usually available for the application of the exolever, and, where such a condition does not exist, the extent of the depression

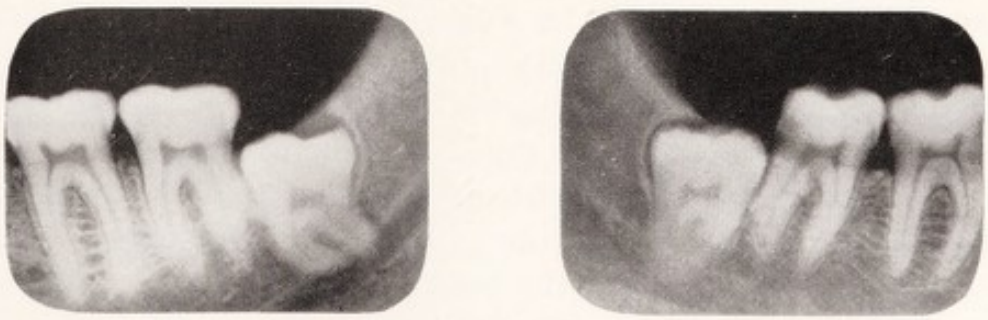


Fig. 76.—Mesial Surface Inaccessible—Vertical Impaction. Vertical type of impacted mandibular third molar where mesial surface is inaccessible to immediate application of exolever.

of the mesial surface below the superior border of the ossistructure is determined.

Mesioangular Impaction.—In Fig. 77 are shown two types of the third molar impacted in a mesioangular position where the mesial surface of the crown is inaccessible to the immediate application of the exolever. This is not an unusual condition in this type of impaction, and the radiogram, if correctly made, will show the distance between the mesial surface and the superior border of the ossistructure, and this will enable the operator to determine, in advance of

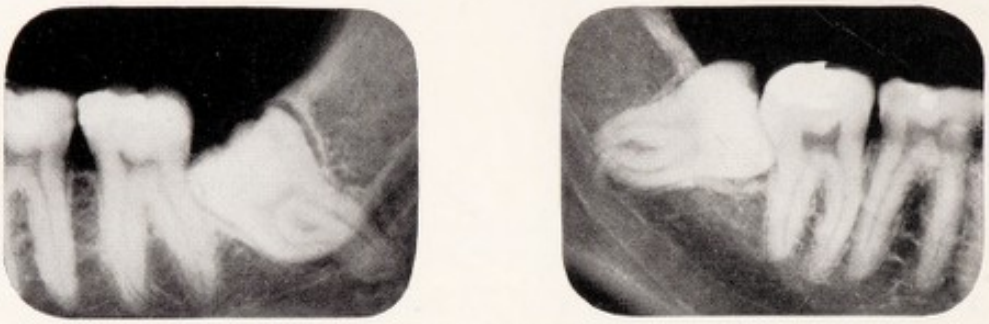


Fig. 77.—Mesial Surface Inaccessible—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar where mesial surface is inaccessible to immediate application of exolever.

Fig. 78.—Mesial Surface Inaccessible—Distoangular Impaction. Distoangular type of impacted mandibular third molar where mesial surface is inaccessible to immediate application of exolever.

the operative procedure, to what extent it will be necessary to excise the ossistructure in order to obtain access to the mesial surface with the exolever. The character of these two cases varies sufficiently to give a good conception of the type of impaction in which the mesial surface of the crown of the third molar is inaccessible to the immediate application of the exolever.

Distoangular Impaction.—In Fig. 78 are shown two types of the third molar impacted in a distoangular position where the mesial surface of the crown is inaccessible to the immediate application of the exolever. As in vertical types of impaction, the cases where the mesial surface is inaccessible to the application of the exolever are not frequently seen in practice. The character of these two cases varies sufficiently to enable the operator to make a comparison of the mesial surface of the third molar with the distal surface of the second molar and the superior border of the ossistructure.

Horizontal Impaction.—In Fig. 79 are shown two types of the third molar impacted in a horizontal position where the mesial surface of the crown is inaccessible to the immediate application of the exolever. This is a common condition found in this type of impaction, and the character of these two cases varies sufficiently to enable the operator to recognize a condition where the mesial surface is inaccessible.

Fig. 79.—Mesial Surface Inaccessible—Horizontal Impaction. Horizontal type of impacted mandibular third molar where mesial surface is inaccessible to immediate application of exolever.

COMPARISON OF ACCESSIBLE AND INACCESSIBLE SURFACES

Mesial Surface.—To differentiate between the accessible and inaccessible mesial surfaces, of the crown requires careful attention to details. As an example of such differentiation, reference is directed to the two enlarged radiograms shown in Figs. 80 and 81, which have been correctly made, of two impacted third molars that have almost the same appearance as to position, root formation and character of ossistructure supporting the tooth. If in either case extraction is contemplated and the mesial surface is studied for the purpose of determining access to that surface, the radiogram in Fig. 80 shows that the mesial surface is accessible to the immediate application of the exolever with a very small blade, while the radiogram in Fig. 81 shows that the mesial surface is inaccessible to the exolever, and that therefore a different extraction procedure is indicated in the latter case. This differentiation may be considered a "hairline" decision, as it is often termed, but it is of great importance, as in the case shown in Fig. 80 excision is not indicated in order to make an application of the exolever to the mesial surface, and, if in the case shown in Fig. 81 the same procedure were attempted, it would result in a failure to execute the proper technic and cause unnecessary trauma. Obtaining an adjustment of the exolever in the case of Fig. 81 is more readily accomplished by an excision of a small part of the ossistructure in the region of the mesial surface, so that the condition will be similar to a case where the mesial surface is accessible. The operator may be able to determine from

the radiogram the extent of excision to be made to cause the least amount of trauma.

Buccal Surface.—There are cases of the impacted third molar where, after a study of the mesial surface has been made for the application of the exolever to this surface, it will be advisable to study the buccal surface of the crown to ascertain whether the instrument can be applied to the latter surface. In some cases of

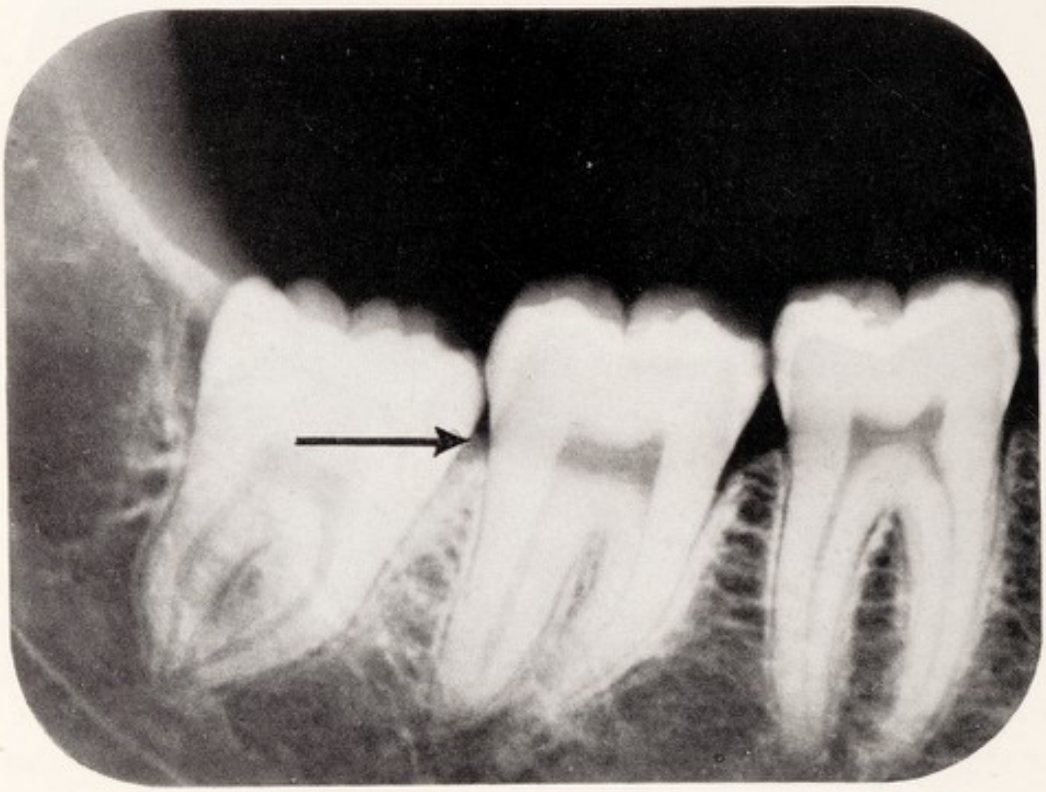


Fig. 80.—Mesial Surface Accessible. An enlarged radiogram of mesioangular type of impacted mandibular third molar where mesial surface is accessible to immediate application of exolever. A comparison should be made with Fig. 81.

this type an immediate application of the exolever can be made to the buccal surface without excision of the ossistructure, and such cases should be differentiated from that type where an application cannot be made without excision. Utilizing the buccal surface for the application of the exolever can be followed in certain types of vertical, mesioangular and distoangular impaction, and in that type of complete lingual deflection where the entire occlusal surface is deflected toward the lingual side of the arch. Where an application of the exolever to the buccal surface is contemplated, a study of the crown is made in conjunction with the ossistructure on the buccal surface, which procedure is described in the case where the character of the ossistructure on the buccal surface of the third molar is interpreted in the radiogram (page 139).

Distal Surface.—The distal surface of the impacted third molar is not often utilized for the application of the exolever. In an occa-

sional case, however, where there is a torsion of the tooth in a vertical, mesioangular or distoangular impaction, the condition will indicate that the exolever be applied to the buccal surface of the crown, which may be located where the distal surface would normally be, to complete the extraction. A study of the distal surface should be made in conjunction with the ossistructure on the distal surface, as described on page 146.

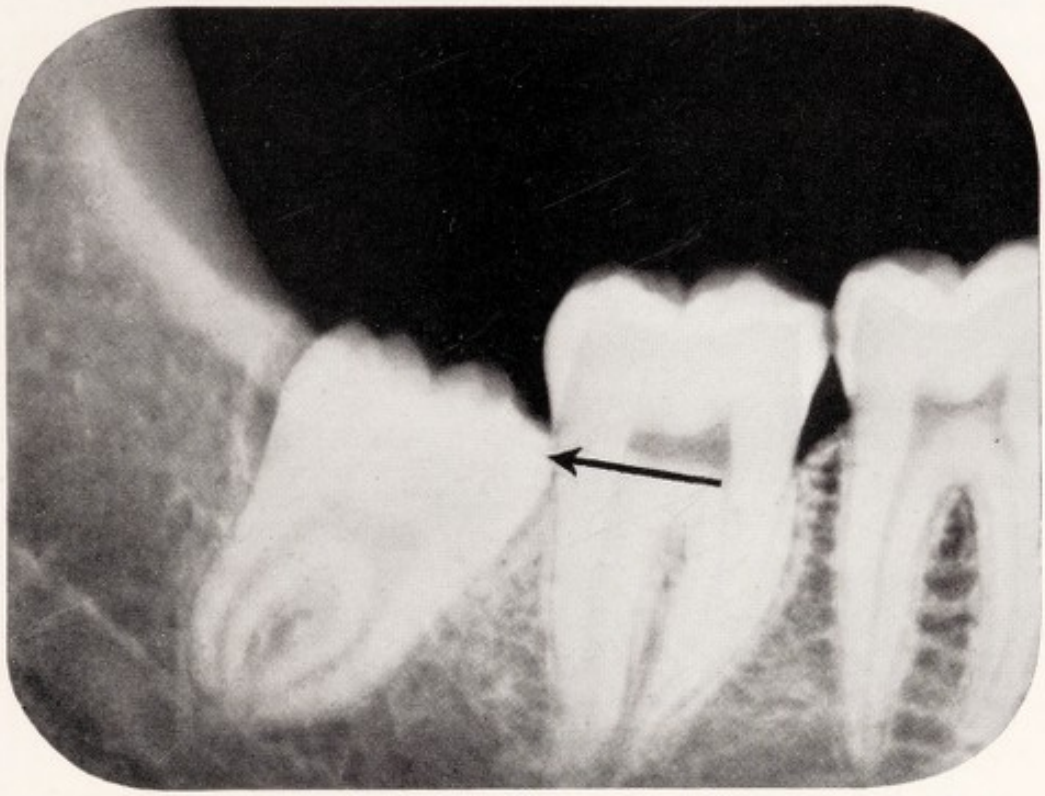


Fig. 81.—Mesial Surface Inaccessible. An enlarged radiogram of mesioangular type of impacted mandibular third molar where mesial surface is inaccessible to immediate application of exolever. A comparison should be made with Fig. 80.

CARIES INVOLVING THE CROWN

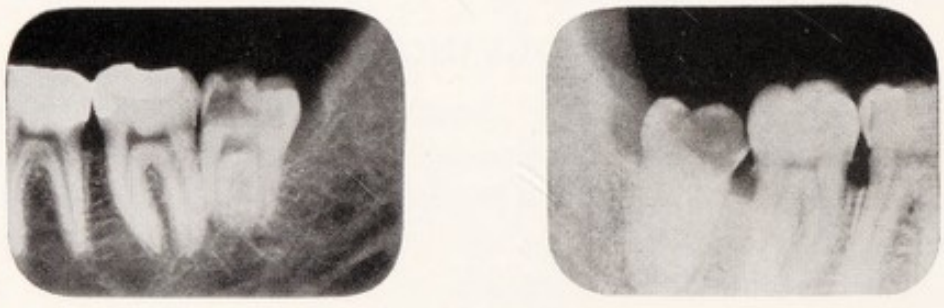
Occasionally, where a part of the crown of an impacted third molar is exposed, a clinical examination will reveal a cavity in the crown, and usually the exploring instrument is used to determine the size of the cavity. It is, however, advisable even in such a case, and where the contemplated operation may appear simple, to make a radiogram of the tooth in order to determine the size of the cavity, so that the strength of the unaffected part of the crown may be ascertained. This knowledge will serve the operator as a guide for the application of the instrument, and, in case a fracture occurs during the extraction of the tooth, the root formation will indicate the subsequent procedure to be followed.

Where, in the case of an impacted third molar, the crown is affected by extensive caries, which weakens the crown, the condition is not so favorable for the application of an exolever as where the crown is

intact. Formerly, where the crown was affected by caries, the bur technic was followed and that part of the crown in contact with the distal surface of the second molar was burred away, the conditions favoring such technic, but the crown that is free from caries presents a stronger resistance to the exolever technic. If, after the necessary excision with the ossisector has been made, the pressure applied with the exolever causes a fracture of the weaker part of the carious crown, the technic should be modified to meet the requirements of the condition.

A careful study of the radiogram should show the strength of the part of the crown not involved and indicate the amount of pressure it will withstand. The operator should then make his diagnosis according to the estimated strength of the surface of the tooth available for the application of the exolever; but, in case a fracture of the crown occurs, he should be governed by the condition at the time of the fracture, taking into consideration the access to the mesial and buccal surfaces and the available ossistructure to be used as a fulcrum.

Vertical Impaction.—In Fig. 82 are shown two types of the third molar impacted in a vertical position where the cavity involves the occlusal surface. In Fig. 82 A the mesial half of the tooth is strong enough to allow the application of the exolever to the mesiobuccal and buccal surfaces. In Fig. 82 B caries has involved the crown to such an extent that an application of the exolever to its mesial surface will cause a fracture; and, as the operator usually expects a fracture in such a case, he should conduct his technic for the extraction of the tooth as if the fracture would occur at the gingival third, or as if he were following a procedure for the extraction of the roots.



A B

Fig. 82.—Caries Involving Occlusal Surface—Vertical Impaction. Vertical type of impacted mandibular third molar where occlusal surface is involved by caries. *A*, mesial surface is strong enough to allow application of exolever, while in *B* application of exolever to mesial surface will cause a fracture.

Frequently in a vertical impaction, where the occlusal surface of the third molar is in alignment with, or slightly below, the corresponding surface of the second, a cavity is found involving the mesial surface. In Fig. 83 are shown two cases of this kind, which belong to the general type seen. The exposure of the pulp in such a case

usually prompts the extraction of the tooth, but the cavity is seldom so extensive as to cause a fracture during extraction. When a cavity of the kind shown is presented, an estimate is made of the strength of the remaining mesial or mesiobuccal surface for the application of the exolever. The exolever for a mesiobuccal application is selected and is applied to the part of the mesiobuccal surface that is not involved. Where the cavity extends to the superior border of the ossistructure, so that an application of the blade cannot be made to the mesiobuccal surface, it may be necessary to excise a part of the ossistructure in order to apply the exolever.

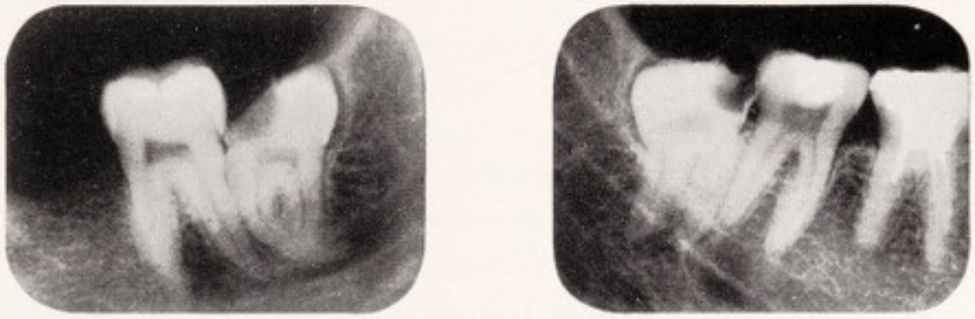


Fig. 83.—Caries Involving Mesial Surface—Vertical Impaction. Vertical type of impacted mandibular third molar, with caries involving greater part of mesial surface of tooth.

Mesioangular Impaction.—In Fig. 84 are shown two types of the third molar impacted in a mesioangular position where the crown is affected by caries, and there is a variation in the extent of the surface involved in the different cases. If a pathologic condition involves the ossistructure below the mesial surface, the application of the exolever can usually be made without excision in this region. There is a variation in the size and location of the cavities, and, where such a condition is presented, the strength of the mesial surface and the access that may be obtained with the exolever can be readily estimated. An estimate can also be made of the resistance that may be expected from the roots.

Fig. 84.—Caries Involving Crown—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, with caries involving crown of tooth.

The distal surface in a mesioangular impaction is seldom involved by caries, but two cases of this kind are shown in Fig. 85. In these

cases the mesial surface is, however, strong enough to withstand the pressure that may be applied with the exolever to direct the tooth distally.

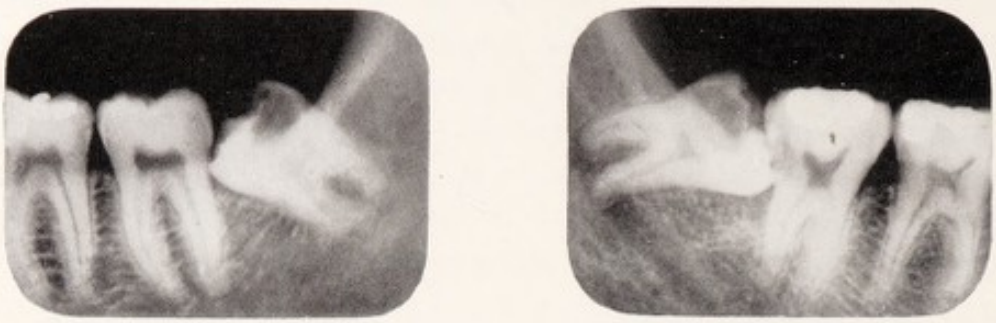


Fig. 85.—Caries Involving Distal Surface—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, with caries involving distal surface of tooth.

Distoangular Impaction.—Caries does not, as a rule, involve this type of an impaction, as the surfaces that would be susceptible to caries are seldom exposed. Where caries involves the crown, the condition further complicates the operative procedure if the mesial surface has been weakened by the involvement. In Fig. 86 are shown two cases of this kind.

Fig. 86.—Caries Involving Crown—Distoangular Impaction. Distoangular type of impacted mandibular third molar, with caries involving crown of tooth.

Horizontal Impaction.—In Fig. 87 are shown two types of the third molar impacted in a horizontal position where the distal surface is involved by caries. In such a case a clinical examination with the probe will present one of the most deceptive conditions when making a diagnosis of an impacted third molar. The explorative examination will reveal extensive caries, and it will be difficult to determine whether the occlusal or distal surface is involved, or whether the tooth is in a vertical, an angular or a horizontal position. There have been many instances of this character where the operator, judging the tooth to be in a vertical position, attempted to extract it with forceps or exolever and failed in the operative procedure. The operator in a case of this kind is usually in a quandary,

and will probably make a radiogram as though the crown were in a vertical or an angular position, only to find after the radiogram has been made that the tooth is in a horizontal position.

The operator should determine from the radiogram the extent of caries and the probable strength of the remaining part of the crown in order that he may conduct his operative technic in accordance with the prevailing condition, and special attention should be directed to the mesial surface. If caries has not extended beyond the pulp chamber, there is usually sufficient strength in the remaining part of the crown to withstand the pressure by the application of the exolever. If, however, decay extends beyond the pulp chamber, the mesial surface is often not strong enough to withstand the pressure of the instrument, and in that event the operator should so conduct his technic that, in case the application of the instrument causes a fracture, he is prepared to continue with a technic that will meet the condition presented.

Fig. 87.—Caries Involving Distal Surface—Horizontal Impaction. Horizontal type of impacted mandibular third molar, with caries involving distal surface of tooth.

In Fig. 88 are shown two types of the third molar impacted in a horizontal position where the occlusal surface is involved by caries. There is a variation in the size of the cavity and the strength of the mesial surface, and in such a case the operator should make an estimate of the strength of the mesial surface to withstand the pressure of the exolever to extract the tooth, determining at the same time the technic to be followed in case a fracture occurs.

Fig. 88.—Caries Involving Occlusal Surface—Horizontal Impaction. Horizontal type of impacted mandibular third molar, with caries involving occlusal surface of tooth.

In Fig. 89 are shown two types of the third molar impacted in an isolated position. There is a variation in the size and location of the cavity in the different cases.

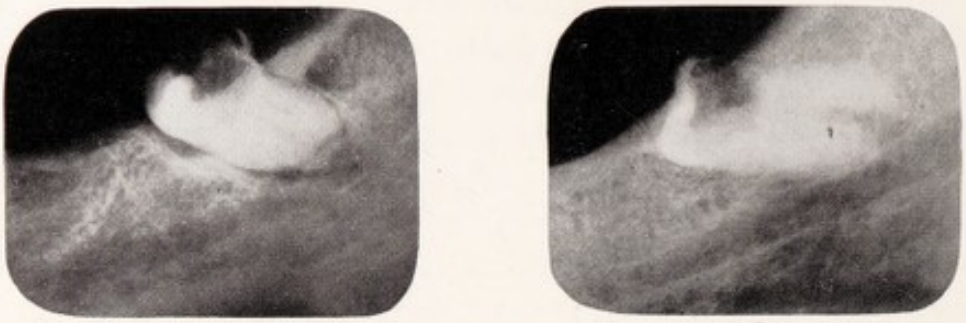


Fig. 89.—Caries Involving Crown—Isolated Impaction. Isolated type of impacted mandibular third molar, with caries involving crown of tooth.

ATTEMPTED EXTRACTION

Where a former operator, in attempting to extract an impacted third molar, caused a fracture of a part of the crown and failed in the extraction, it is imperative that the succeeding operator obtain a radiogram of the case, as the condition may present, in addition to the diagnostic points as a guide to the procedure to be followed, a number of features of a somewhat questionable nature, involving, possibly, points of a legal character. In such a case the work of the former operator should not be criticized by the succeeding operator, as the latter will not be familiar with the circumstances under which the previous work was done. The usual history of such a case is that the former operator attempted a forceps or an exolever technic without a knowledge of prevailing conditions.

A case of the character described may be presented on the day on which the operation was attempted, but is usually presented several days afterward, and a study of the peridental membrane will reveal, as shown by the radiogram, the nature and extent of the disturbance of this membrane. The reason for such a fracture of the tooth and failure in the extraction can usually be attributed to operating without having a radiogram made as a guide for the operation, so that a definite method of procedure could follow a correct interpretation of the radiogram. The most common errors made in an operative procedure are (1) the application of the exolever to the tooth with great pressure without previously excising the ossistructure at the point of resistance; (2) the application of the instrument to a surface that is not strong enough to withstand the necessary pressure; (3) improper application of the instrument to the tooth; (4) failure to consider the character of the root formation, and (5) the use as a fulcrum of a part of the ossistructure that cannot be properly employed for that purpose.

Where an attempt is made to apply the beaks of the forceps to the

part of the crown of the third molar that is exposed beyond the superior border of the ossistructure, it will frequently be found, when the necessary pressure for the extraction is applied, that the root formation and the supporting structure will be such a resisting factor that a fracture of a part of the crown is the usual result. In such a case, even if the crown is not fractured, the application of greater pressure or a repeated renewal of the application of the forceps will further complicate the extraction of the tooth.

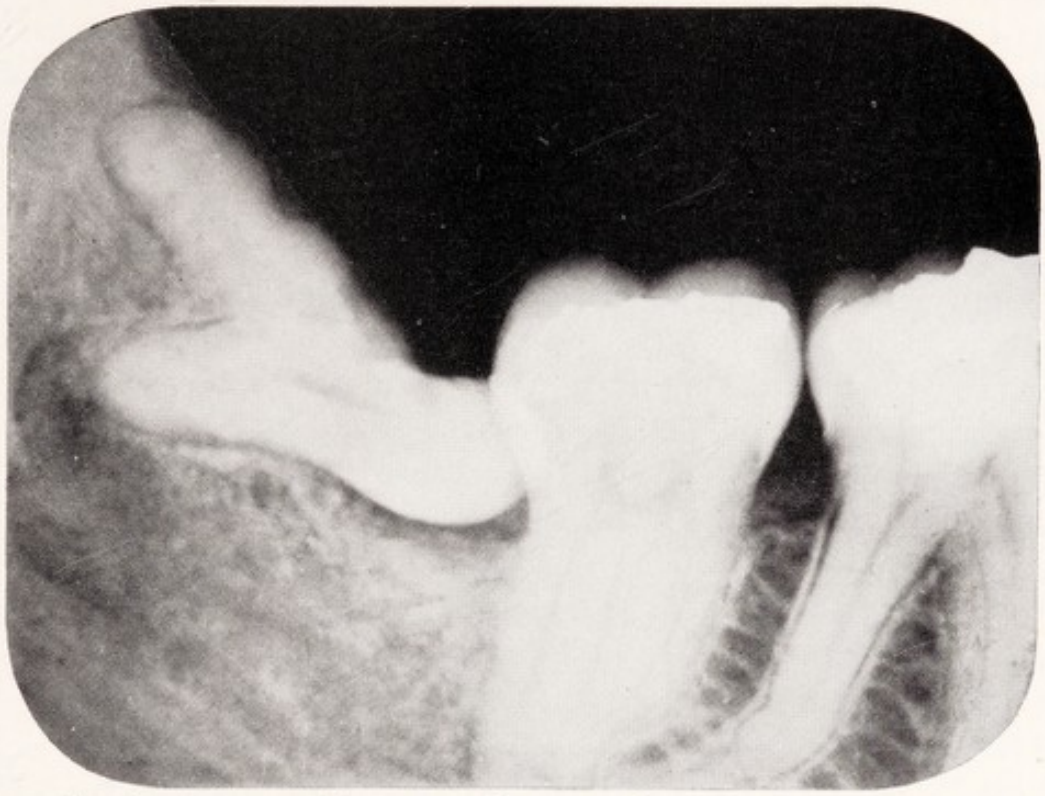


Fig. 90.—Attempted Extraction—Horizontal Impaction. An enlarged radiogram of horizontal type of impacted mandibular third molar where a previous attempt was made to extract tooth with a forceps technic.

In an interpretation of the radiogram of a case where a fracture of a part or the whole of the crown had occurred, the crown, in the majority of angular or horizontal types, was shown to be deflected buccolingually, but the mesial surface was accessible to an exolever, presenting evidence that no attempt had been made to reach the mesial surface, and that no consideration had been given to that part of the crown deflected buccally out of alignment with the distobuccal surface of the second molar.

In a case where an attempt had been made to extract the third molar and the procedure had not been entirely successful, attention should be directed to the second molar to determine whether any injury had occurred to the latter tooth.

In Fig. 90 is shown a case of impacted third molar that was of unusual interest to the author on account of its history, which revealed

that four different attempts by as many operators had been made to extract the tooth, which was then presented at a clinic before a dental society as an extremely complicated case on account of the many previous attempts at extraction. A radiogram of the case, however, presented an entirely different condition, and this point is emphasized to show the importance of having a radiogram correctly made and intelligently interpreted, so that a definite operative technic could be applied, which was done in this case with one instrument and one application.

The radiogram shows that the ossistructure on the distal surface of the third molar had been fractured away with forceps, as no such fracture could have been caused with an exolever, and, in addition, all of the ossistructure on the distal root had been fractured away with the beaks of the forceps, as shown by the number of indentions on the root. As all of the ossistructure on the distal surface and distal root had been fractured away, no excision in this region was indicated.

A study of the remaining part of the crown shows that it is strong enough to withstand the application of an exolever to the mesial surface without fracturing, and that this surface is accessible. In this case the buccolingual deflection was the cause of the failure, as the ossistructure on the buccal surface interfered with a buccal movement, and a lingual movement was impossible on account of the impingement of part of the occlusal surface of the third molar upon the distobuccal surface of the second. The roots, which are divergent, with a large septum between them, also offered a great deal of resistance to a forceps technic.

As the peridental membrane showed an involvement, and no excision of the ossistructure was indicated, the application of an exolever below the mesial surface to direct the tooth upward and distally was all that was necessary to extract the tooth.

Vertical Impaction.—In Fig. 91 are shown two types of the third molar impacted in a vertical position where a previous attempt had been made to extract the tooth, and the radiogram shows a fracture

Fig. 91.—Attempted Extraction—Vertical Impaction. Vertical type of impacted mandibular third molar where a part of crown was fractured in an attempt to extract tooth.

of a part of the crown. A study of these cases should be made to determine the cause of the fracture and the reason for the failure to extract the tooth. In the majority of such cases the ossistructure on the distal surface was not excised.

Mesioangular Impaction.—In Fig. 92 are shown two types of the third molar impacted in a mesioangular position where a part of the crown had been fractured in an attempted extraction. In these cases a part of the mesial surface of the crown remained, the part of the distal surface that was beyond the superior border of the ossistructure had been fractured, and the ossistructure extended on the distal surface in line with the remaining part of the crown. A study of these cases will show that the exolever, owing to a pathologic condition of the ossistructure below the mesial surface, can be applied to this surface, but that the resisting ossistructure on the distal surface, if not excised, will prevent any successful operative technic unless the operator decides to excise that part of the crown of the third molar in contact with the second. In case a forceps technic is to be followed, a sufficient amount of additional ossistructure on the distal, buccal and lingual surfaces should be excised in order to permit the extraction of the tooth with forceps. All of this procedure is, however, unnecessary as the ossistructure on the distal surface can be readily excised sufficiently to allow the tooth to be directed distally by an application of the exolever below the mesial surface, and this will obviate excising any part of the heavy buccal plate. A study is made of these two cases to determine the extent of the fracture of the occlusal and distal surfaces, the location of the contact of the third molar with the second, the location of the superior border of the ossistructure, the amount of ossistructure on the distal surface and the character of the root formation.

Distoangular Impaction.—In Fig. 93 are shown two types of the third molar impacted in a distoangular position where a part of the crown had been fractured during an attempt to extract the tooth. In such a case the failure to extract is usually due to not having excised the ossistructure on the distoclusal and distal surfaces.

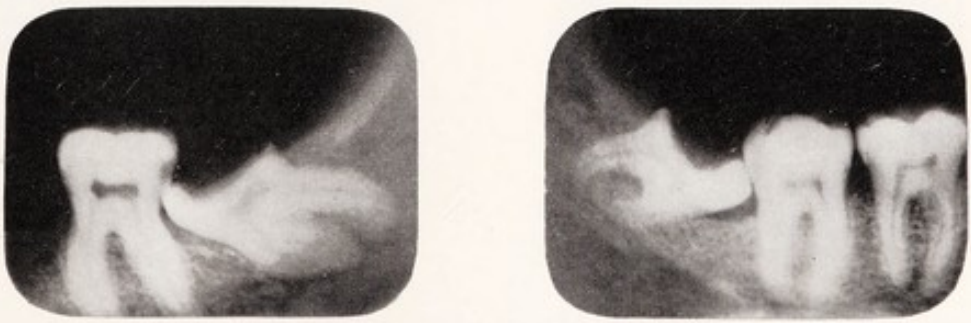
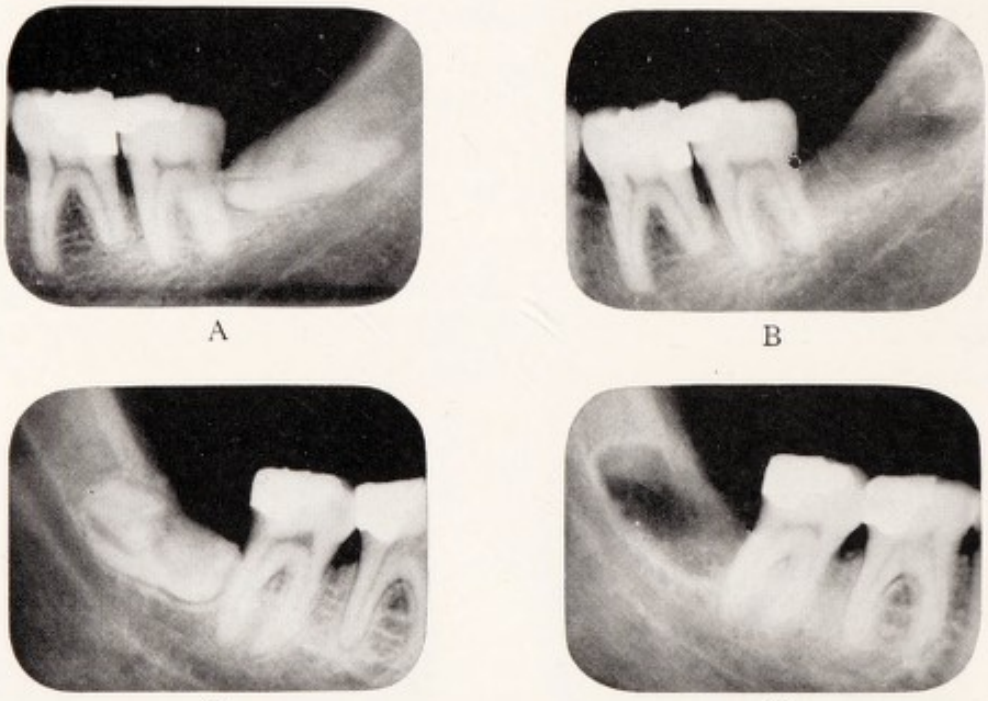


Fig. 92.—Attempted Extraction—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar where a part of crown was fractured in an attempt to extract tooth.

Fig. 93. — Attempted Extraction — Distoangular Impaction. Distoangular type of impacted mandibular third molar where mesial surface and part of occlusal surface were fractured in an attempt to extract tooth.

Horizontal Impaction.—In Fig. 94 are shown two types of the third molar impacted in a horizontal position, with radiograms of the cases after extraction, where a part of the crown had been fractured during an attempt to extract the tooth. In this type of a case the same condition prevails as described above in the type of mesioangular impaction (Fig. 92), with the exception that the ossistructure below the mesial surface is not affected by a pathologic condition, and this surface is consequently not accessible to the immediate application of the exolever. It will, therefore, be necessary to excise the ossistructure in order to gain access to the mesial surface.

In these cases the location of the ossistructure on the distal surface should be noted, and also the contact of the occlusal surface of the third molar with the distobuccal surface of the second. A study should be made of the probable strength of the remaining part of the mesial surface to withstand the pressure to be applied with the exolever.



A B C D

Fig. 94.—Attempted Extraction—Horizontal Impaction. Two cases of horizontal type of impacted mandibular third molar where part of crown was fractured in an attempt to extract tooth. *A* and *C*, radiograms before operation; *B* and *D*, radiograms made after extraction.

Complete Lingual Impaction.—In Fig. 95 are shown radiograms of a complete lingual impaction, with three radiograms of the case after extraction. In this case the operator had made an attempt to extract the tooth without having a definite idea of the character of the impaction, and the details presented demonstrate the importance of making a correct interpretation of a radiogram in advance of any operative procedure.

In Fig. 95 A, which is the first radiogram of the case, the occlusal surface appears as a disk, with a part of the crown fractured. Operating on such a case, either with forceps or exolever, without knowledge of the position of the tooth is sheer guesswork, and such a procedure usually results in the operator making repeated applications of the instrument to surfaces on which a secure adjustment cannot be made. Even if a secure adjustment is obtained, the proper extraction move-

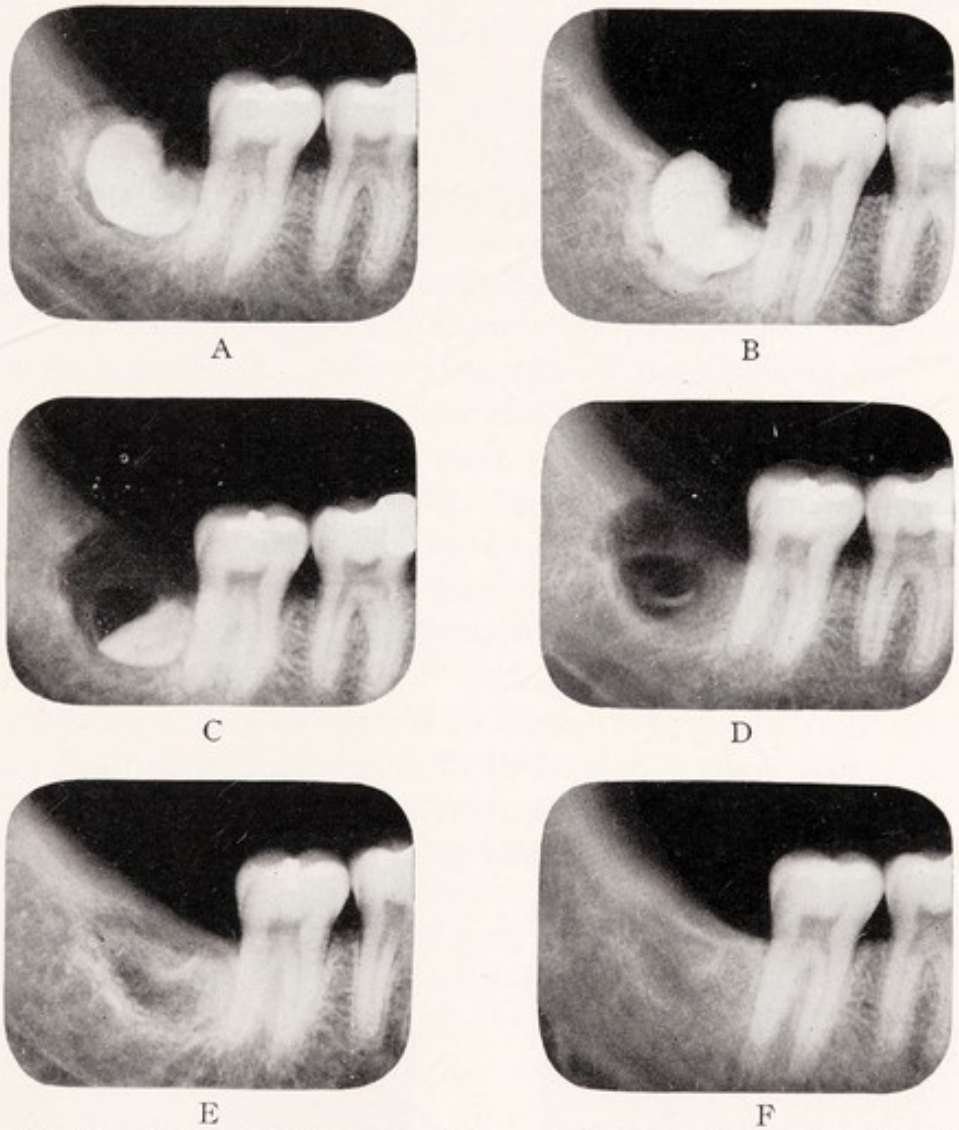


Fig. 95.—Attempted Extraction—Complete Lingual Impaction. Complete lingual deflection of an impacted mandibular third molar where an attempt was made to extract tooth. *A*, first radiogram made; *B*, second radiogram made, which shows a part of root formation; *C*, radiogram made after second attempt at extraction; *D*, radiogram of completed extraction; *E* and *F*, radiograms made four and eight months respectively after extraction.

ments are often not executed in conformity with the root formation, and the movements usually applied are made in a direction opposite to those that would be correct.

In Fig. 95 B is shown the second radiogram, presenting a part of the root formation. While only an indefinite outline of the root formation could be obtained in the second radiogram, it nevertheless indicates that there is a bifurcation of the roots.

In Fig. 95 C is shown the third radiogram, which was made after the extraction of the major part of the tooth, leaving the mesial third of the crown, which evidently was fractured at the first operation, and the size of the remaining part will indicate the technic for its extraction.

In Fig. 95 D is shown the completed case, in which the undisturbed condition of the septum is outlined. In Fig. 95 E is shown a radiogram made four months after the operation. In Fig. 95 F is shown a radiogram made eight months after the operation.

CROWN WITH THE ROOTS PARTIALLY DEVELOPED

Where the crown of the impacted third molar has assumed an abnormal position in a case where the roots of the tooth are partially developed, and where for orthodontic reasons the extraction of the tooth is indicated, the radiogram is studied to determine the size, shape and position of the crown, its contact with the second molar, and the character of any deflection that may be present. In such a case, when the exolever is applied, there will not be the normal resistance that would prevail if the roots were fully developed, and the application of the instrument should be made with caution on account of the lack of a suitable fulcrum. Where the roots are partially developed and the supporting ossistructure is not of an adequate character, it is not to be expected that a proper application of an exolever can be made or that a suitable fulcrum can be secured.

In Fig. 96 are shown two cases where the roots are partially developed. A study of these cases will show a variation in the location of the crown of the third molar compared with the crown of the second, and also a variation in the partially developed root formation.

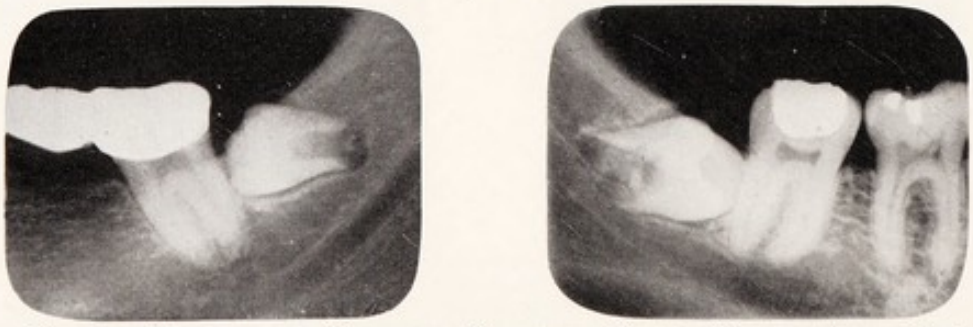


Fig. 96.—Crown with Partially Developed Roots. Crown of mandibular third molar where roots are partially developed, showing variations in position of crown and in partially developed root formation.

CHAPTER VI

Radiographic Interpretation of the Roots of the Impacted Mandibular Third Molar

AFTER a thorough study from the radiogram has been made of the crown of the impacted mandibular third molar, the anatomic formation of the roots should be interpreted, with a consideration of their size, formation and direction. The roots will vary in size from very short to exceedingly long; they will vary in formation from being fused into a solid mass of a conical shape to consisting of two distinct roots markedly divergent, and the direction will vary from straight to a marked distal inclination. In an occasional case an extra root may be present, and there may be a bifurcation of the mesial or distal root, or both of these roots may have a bifurcation. All these points are factors that usually affect the amount of resistance that may be expected, and, in connection with the diagnosis of the crown and ossistructure, will govern the technic for the extraction of the tooth.

When the operator has fully determined the character of the root formation, he should have no hesitancy in executing the indicated movements with an exolever in a direction that will conform to the anatomic formation of the roots, provided he has made a definite diagnosis of the root formation in the radiogram, and has excised the ossistructure in a manner to allow the exolever movements to be made as indicated by the root formation.

The lingual radiogram will not outline definitely the exact long axis of one root in its relation to the other where the roots are inclined lingually or buccally out of alignment with their long axes, but such cases are only occasionally seen. The interpretation of the radiogram, however, will give in the majority of cases some idea of such a root formation when present. Where the lingual radiogram indicates a lingual or buccal deflection of the roots, an occlusal radiogram should be made to detail the condition.

Roots Inclined Distally.—Where the radiogram shows both roots of the third molar inclined distally, an examination should be made of their size and length, of the amount of septum that may exist between the roots and of the distance the roots are directed distally, so that in the execution of the exolever technic the distance to which the crown may be directed distally will conform to the curvature

indicated in the radiogram. A distal inclination of both roots is considered a favorable condition in most cases of vertical impaction, except where the occlusal surface of the third molar is quite a distance from the corresponding surface of the second and the ossistructure extends on the distal surface up to the occlusal surface of the third molar, with the roots unusually long.

In the majority of cases where the tooth is in a mesioangular position the root formation is favorable for the extraction of the tooth, as the direction of the roots will conform to the extraction movements to be applied with the exolever.

Where the tooth is in a distoangular position, this type of root formation is not favorable for the execution of the extraction movements after the necessary excision of the ossistructure has been made.

Where the tooth is in a horizontal position, the root formation is very favorable for the execution of the exolever technic, but such a root formation is seldom seen in this type of impaction.

In Fig. 97 are shown two types of vertical impaction; in Fig. 98, two types of mesioangular impaction; in Fig. 99, two types of distoangular impaction, and in Fig. 100, two types of horizontal impaction. In these four types of impaction the roots are inclined distally and vary in size and shape. There is also a variation in the position of the crown compared with the position of the occlusal surface of the second molar and the superior border of the ossistructure. This type of root formation is not so common as may be supposed, and the direction of the roots and the degree of their curvature vary to such an extent that the operator must govern his technic to conform to the root formation.

Mesial Root Inclined Distally and Distal Root Straight.—It is not unusual to find a case where the mesial root is inclined distally and the distal root is straight, as this condition is the most common type. In such a case the operator observes the extent of the curvature of the mesial root and its length and size, and compares these points with the straight distal root, as the latter root is often somewhat shorter or longer than the mesial root. The size of septum between the roots is examined to note to what extent it may increase the resistance. It will be observed that the distal curvature of the mesial root and the straight distal root in a vertical impaction will not allow the tooth to be directed very far distally with an exolever, as may be done where both roots are inclined distally, and the operative technic should be so executed as to avoid a fracture of the straight distal root, which is liable to occur where the tooth is directed too far distally.

In an angular type of impaction the operator can execute the

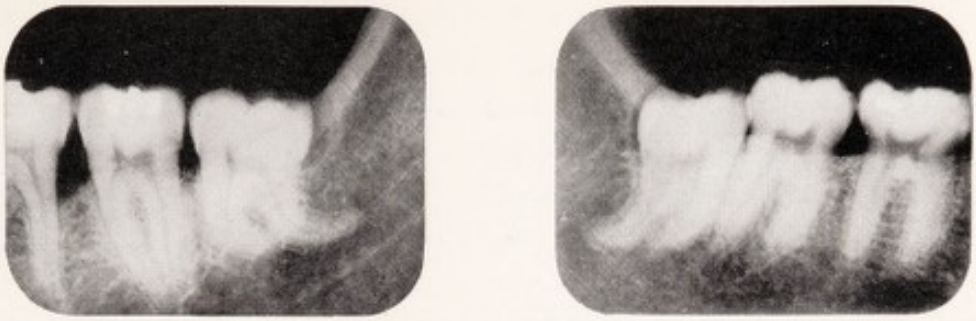


Fig. 97.—Roots Inclined Distally—Vertical Impaction. Vertical type of impacted mandibular third molar where roots are inclined distally and vary in size and shape.

Fig. 98.—Roots Inclined Distally—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar where roots are inclined distally and vary in size and shape.

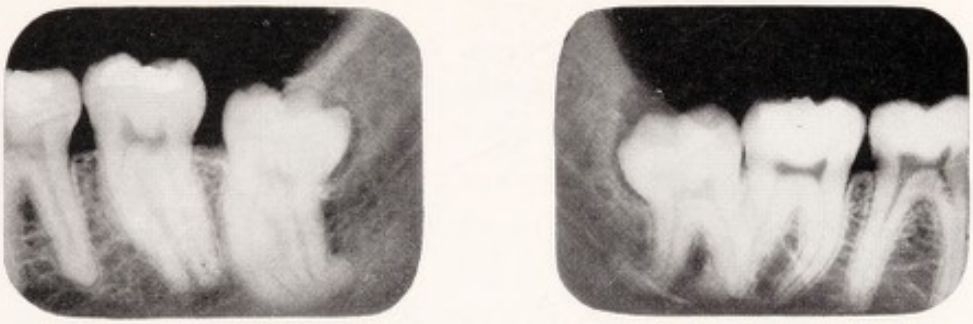


Fig. 99.—Roots Inclined Distally—Distoangular Impaction. Distoangular type of impacted mandibular third molar where roots are inclined distally and vary in size and shape.

Fig. 100. — Roots Inclined Distally — Horizontal Impaction. Horizontal type of impacted mandibular third molar where roots are inclined distally and vary in size and shape.

extraction movements to conform to this kind of root formation, and such a root formation in a horizontal impaction does not necessarily change the direction of the extraction movements when an exolever is employed.

Fig. 101.—Mesial Root Inclined Distally, Distal Root Straight—Vertical Impaction. Vertical type of impacted mandibular third molar where mesial root is inclined distally and distal root is straight, roots varying in size and shape.

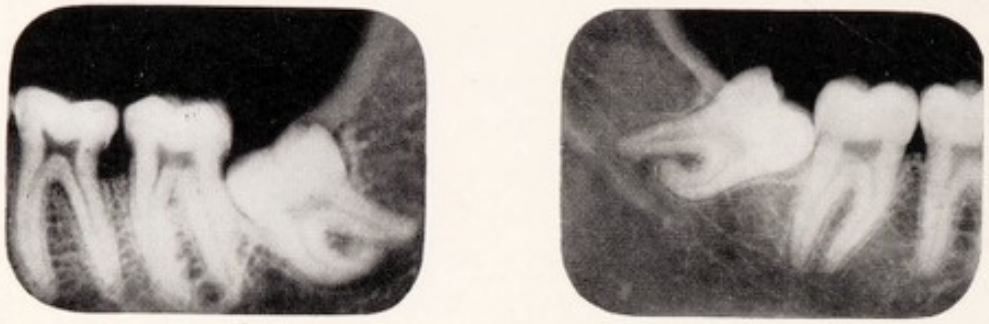


Fig. 102.—Mesial Root Inclined Distally, Distal Root Straight—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar where mesial root is inclined distally and distal root is straight, roots varying in size and shape.

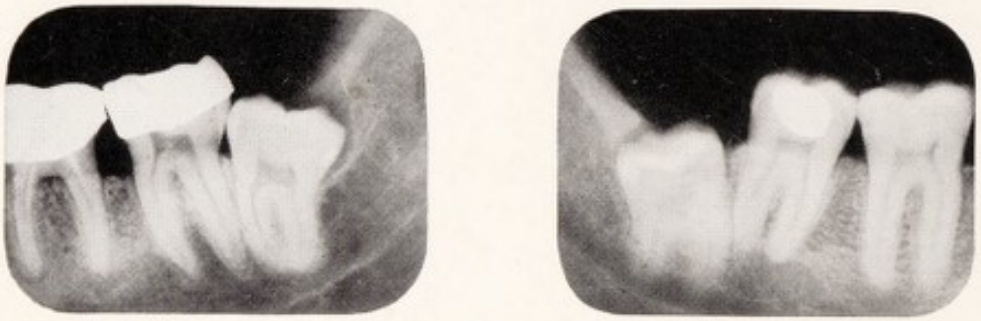


Fig. 103.—Mesial Root Inclined Distally, Distal Root Straight—Distoangular Impaction. Distoangular type of impacted mandibular third molar where mesial root is inclined distally and distal root is straight, roots varying in size and shape.

Fig. 104.—Mesial Root Inclined Distally, Distal Root Straight—Horizontal Impaction. Horizontal type of impacted mandibular third molar where mesial root is inclined distally and distal root is straight, roots varying in size and shape.

In Fig. 101 are shown two types of vertical impaction; in Fig. 102, two types of mesioangular impaction; in Fig. 103, two types of distoangular impaction, and in Fig. 104, two types of horizontal impaction.

In these four types of impaction the mesial root is inclined distally and the distal root is straight, the roots varying in size and shape.

Mesial Root Inclined Distally and Distal Root Inclined Mesially.—It is not unusual to find the mesial root inclined distally and the distal root inclined mesially. The radiogram will show the size of the roots, the extent to which they come together at the apices and the size of the septum. Increased resistance to the force applied with an exolever will be encountered in proportion to the increase in the size of the roots and septum. In a vertical type of impaction special attention should be directed to the degree of curvature of the roots, as the condition will govern largely the extent to which the operator may direct the crown distally. The object, where the mesial and distal roots are in the positions mentioned, is to direct the tooth far enough distally to overcome the resistance of the septum, but not so far as to produce a fracture of the crown or roots.

Where the tooth is in an angular position, the operative technic will be practically the same as in a case where the tooth is in a vertical position, and should be directed distally with an exolever far enough to overcome the resistance of the roots and produce a clean fracture of the septum.

Where the tooth is in a horizontal position, the resistance presented by the root formation will not have the effect of changing the direction of the extraction movements, with the exception that, where the exolever is used, sufficient force should be exerted on the first application of the instrument to produce a fracture of the septum between the roots.

The diagnostic point to observe is the formation of the roots, so that when the extraction movement is made, the tooth will be directed to a distance that will produce a fracture of the septum if present. Not to observe properly this diagnostic point in such a case is to hazard a fracture at the gingival third.

In Fig. 105 are shown two types of vertical impaction; in Fig. 106, two types of mesioangular impaction; in Fig. 107, two types of distoangular impaction, and in Fig. 108, two types of horizontal impaction. In these four types of impaction the mesial root is inclined distally and the distal root is inclined mesially, the roots varying in size and shape.

Roots Fused.—Where the radiogram shows that the roots of an impacted third molar are fused into a solid mass and are of a conical shape, less resistance may be expected during the extraction, irrespective of the position of the tooth, than where the roots are bifurcated and markedly divergent. The circumspective operator always hopes, when a case of impaction is presented, that the roots will be

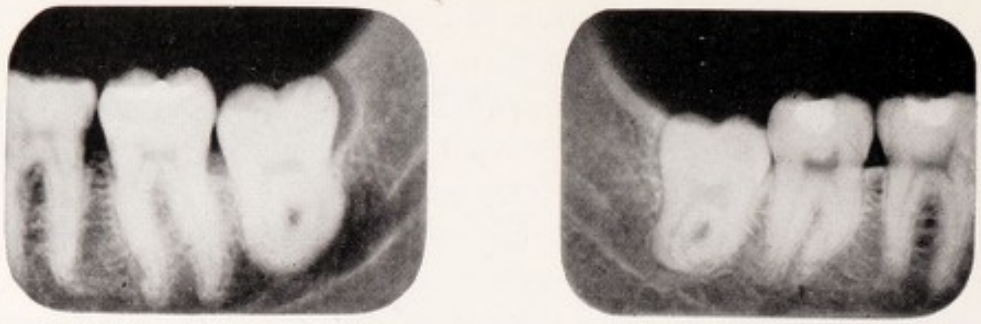


Fig. 105.—Mesial Root Inclined Distally, Distal Root Inclined Mesially —Vertical Impaction. Vertical type of impacted mandibular third molar where mesial root is inclined distally and distal root is inclined mesially, roots varying in size and shape.

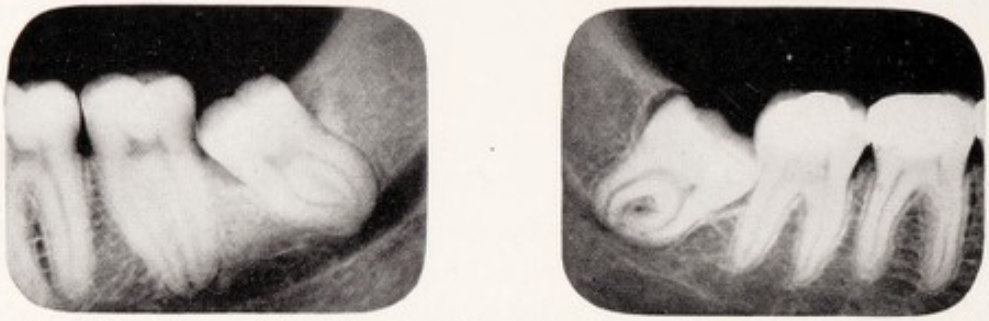


Fig. 106.—Mesial Root Inclined Distally, Distal Root Inclined Mesially —Mesioangular Impaction. Mesioangular type of impacted mandibular third molar where mesial root is inclined distally and distal root is inclined mesially, roots varying in size and shape.

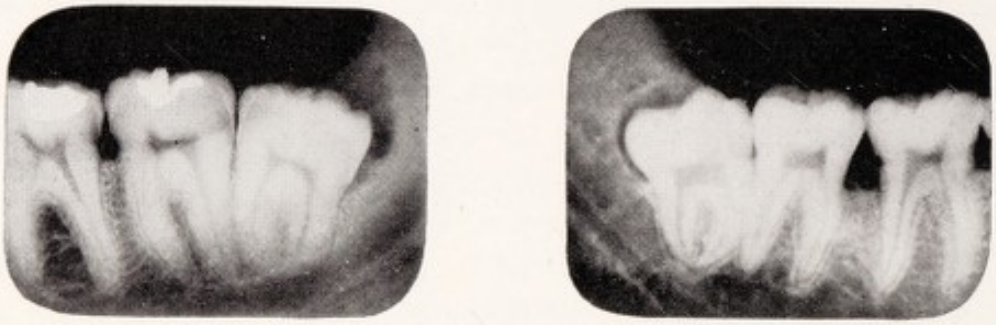


Fig. 107.—Mesial Root Inclined Distally, Distal Root Inclined Mesially —Distoangular Impaction. Distoangular type of impacted mandibular third molar where mesial root is inclined distally and distal root is inclined mesially, roots varying in size and shape.

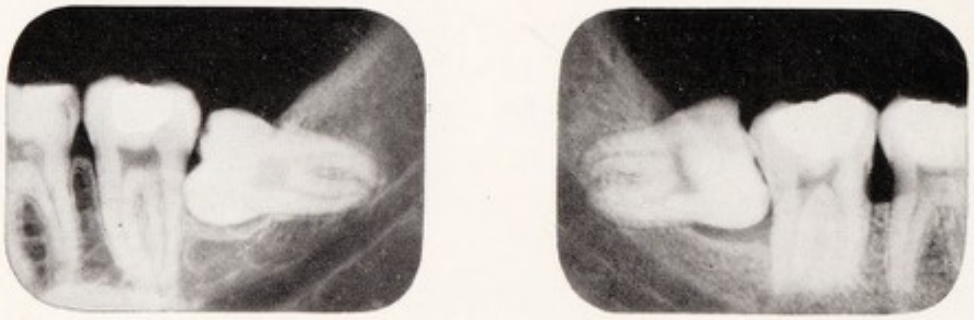


Fig. 108.—Mesial Root Inclined Distally, Distal Root Inclined Mesially —Horizontal Impaction. Horizontal type of impacted mandibular third molar where mesial root is inclined distally and distal root is inclined mesially, roots varying in size and shape.

fused, but the cases where this condition exists are not of such frequent occurrence as the other types of root formation.

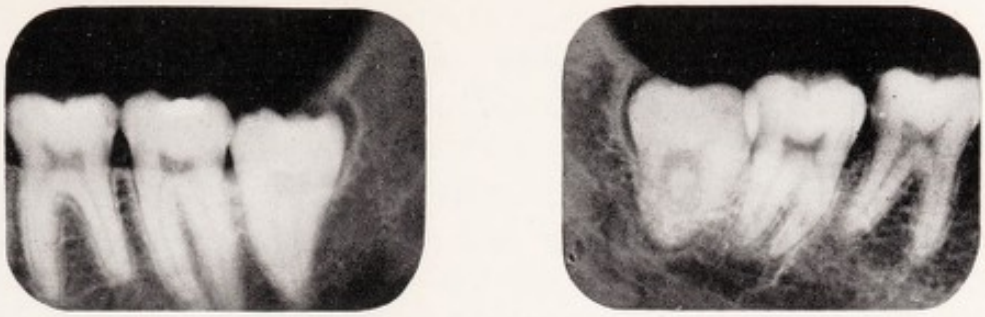


Fig. 109.—Roots Fused—Vertical Impaction. Vertical type of impacted mandibular third molar where roots are fused and vary in size and shape.

Fig. 110.—Roots Fused—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar where roots are fused and vary in size and shape.

Fig. 111.—Roots Fused—Distoangular Impaction. Distoangular type of impacted mandibular third molar where roots are fused and vary in size and shape.

Fig. 112.—Roots Fused—Horizontal Impaction. Horizontal type of impacted mandibular third molar where roots are fused and vary in size and shape.

As there is usually no septum to consider, the resistance will be only slight, and the absence of the septum is of importance in estimating the amount of resistance that may be expected.

Where the crown is in a vertical position and the roots are fused in a conical shape, and where there is no contact with the second

molar, the application of the exolever to the buccal surface should be made with caution, so that the operator may not lose control of the tooth when applying a tractile movement and allow it to drop into the oral cavity. In many cases in a vertical type of impaction a proper application of the exolever to extract the tooth in line with its long axis, after the resisting ossistructure has been excised, will extract the tooth on the initial application of the instrument.

In Fig. 109 are shown two types of vertical impaction; in Fig. 110, two types of mesioangular impaction; in Fig. 111, two types of distoangular impaction, and in Fig. 112, two types of horizontal impaction. In these four types of impaction the roots are fused, and vary in size and shape.

The complete fusion of the roots does not always decrease resistance during extraction, as both roots may be fused and not taper to the end in a conical shape.

In Fig. 113 are shown radiograms of a case before and after extraction, also a photograph of the extracted tooth. In Fig. 113 A is shown a radiogram of a case where the roots are fused into a solid mass and the apical third is inclined mesially, which condition will increase the resistance when the extraction movements with an exolever are applied. In Fig. 113 B is shown a radiogram of the socket after the extraction of the tooth, and in Fig. 113 C is shown the extracted tooth. It will be observed in the photograph that there is a depression at the bifurcation of the roots, which will increase the resistance.

A

B

C

Fig. 113. — Roots Fused and Inclined Mesially — Horizontal Impaction. *A*, impacted mandibular third molar where roots are fused, with apical third inclined mesially; *B*, socket after extraction; *C*, extracted tooth.

Both Roots Straight and Separated.—Where the radiogram shows both roots as being straight and separated, the operator should consider their formation in connection with the position of the crown, and determine the most favorable direction in which the extraction movements can be executed with an exolever after the necessary excision has been made. If, in such a case, the crown is in a vertical position and not in contact with the second molar, and is not deflected buccally, the upward tractile movement with the exolever is favored; but, if the crown is deflected buccally or is in an angular position, the straight roots are not so favorable for an extraction movement in line with their axes or for a distal extraction movement as where the roots are distally inclined, or where the mesial root is inclined distally and distal root is straight.

In the mesioangular and horizontal types of impaction, where the mesial surface of the third molar is below the superior border of the ossistructure, one or both roots are prone to fracture if the extraction movement is not made in a direction to decrease the resistance of the septum, and the operator should examine the point of division of the roots at the bifurcation and the size of the septum in anticipation of the fracture of one or both roots, so that in case a fracture of the roots occurs, a technic for their extraction shall have been determined in advance.

The operator should, however, endeavor to avoid a fracture, giving special consideration to the position of the roots and their condition, the latter being an important factor in the radiographic interpretation. Where the roots are straight and short, the interference will be comparatively slight, but the resistance will be increased in proportion to the increase in length of the roots. This type of root formation is not, however, frequently found.

In a horizontal type of impaction an operator not accustomed to the operative technic described may hesitate to direct the tooth upward and distally. It has been the experience of the author that a large root formation of this character will not fracture, but that a fracture may be expected where one or both roots are small in circumference. This type of root formation does not usually occur in a distoangular impaction.

In Fig. 114 are shown two types of vertical impaction; in Fig. 115, two types of mesioangular impaction, and in Fig. 116, two types of horizontal impaction. In these three types of impaction the roots are straight and vary in size and shape.

Mesial Root Straight and Distal Root Inclined Mesially.—A case where the mesial root is straight and the distal root is inclined mesially is not frequently found in practice. In such a case the rela-

Fig. 114.—Roots Straight and Separated—Vertical Impaction. Vertical type of impacted mandibular third molar where roots are straight and separated and vary in size and shape.

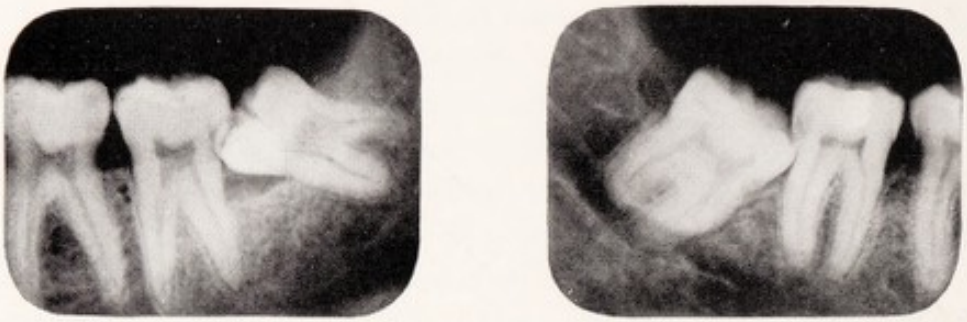


Fig. 115.—Roots Straight and Separated—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar where roots are straight and separated and vary in size and shape.

Fig. 116.—Roots Straight and Separated—Horizontal Impaction. Horizontal type of impacted mandibular third molar where roots are straight and separated and vary in size and shape.

tive positions of the distal and mesial roots, with their respective septums, are factors to be considered, especially if the roots are very long.

In Fig. 117 are shown two types of vertical impaction; in Fig. 118, two types of mesioangular impaction, and in Fig. 119, two types of horizontal impaction. In these three types of impaction the mesial root is straight and the distal root is inclined mesially, the roots varying in size and shape.

Both Roots Inclined Mesially.—It is a rare occurrence to find both roots inclined mesially, but a radiogram will occasionally reveal such a condition. The important diagnostic points in such a case are (1) to what extent may the curvature of the roots increase the resistance, and (2) whether such resistance can be overcome by a greater

Fig. 117.—Mesial Root Straight, Distal Root Inclined Mesially — Vertical Impaction. Vertical type of impacted mandibular third molar where mesial root is straight and distal root is inclined mesially, roots varying in size and shape.

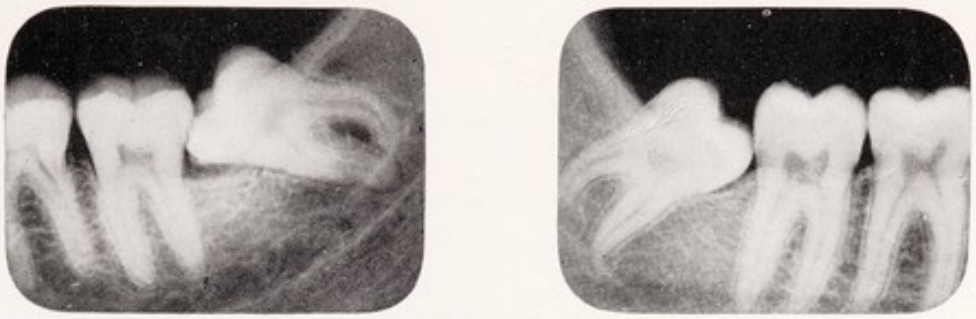


Fig. 118.—Mesial Root Straight, Distal Root Inclined Mesially — Mesioangular Impaction. Mesioangular type of impacted mandibular third molar where mesial root is straight and distal root is inclined mesially, roots varying in size and shape.

Fig. 119.—Mesial Root Straight, Distal Root Inclined Mesially — Horizontal Impaction. Horizontal type of impacted mandibular third molar where mesial root is straight and distal root is inclined mesially, roots varying in size and shape.

excision of the ossistructure on the distal surface. The size of the roots should also be considered in connection with their curvature.

It is a matter of surprise to observe that, in the extraction of impacted third molars with roots curved as described, there are not more fractures, indicating the liberty that may often be taken, when making the extraction movements in a distal direction with an exolever, before a fracture will occur. This type of root formation, if encountered in a vertical impaction, would be an extremely rare case; it may be present in a mesioangular impaction, is rarely found in a distoangular impaction, but occurs occasionally in a horizontal impaction.

In Fig. 120 are shown two cases of this type, with a pathologic condition of the ossistructure below the mesial surface, which will allow pressure to be applied downward on the crown for the purpose of fracturing the septum between the roots, and in most instances this will avoid a fracture of the roots.

Fig. 120.—Both Roots Inclined Mesially. Impacted mandibular third molar where both roots are inclined mesially.

Divergent Roots.—Roots with divergencies other than those described are the exception. Where, however, the radiogram presents an exceptional case, an examination should be made of the character of the divergency, and taking into consideration the root formation and the ossistructure, a procedure is adopted that is calculated to decrease the probable resistance and afford a method of extracting the tooth without producing a fracture.

In Fig. 121 are shown two cases of vertical impaction; in Fig. 122, two cases of mesioangular impaction; in Fig. 123, two cases of distoangular impaction, and in Fig. 124, two cases of horizontal impaction.

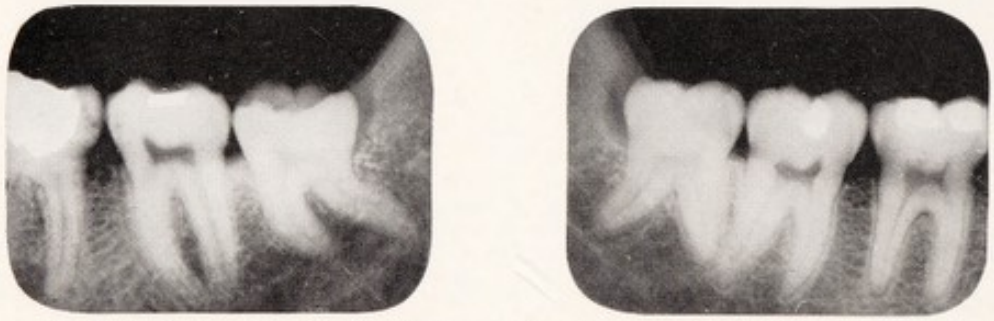


Fig. 121.—Divergent Roots—Vertical Impaction. Vertical type of impacted mandibular third molar, showing divergencies in root formation.

Fig. 122. — Divergent Roots — Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, showing divergencies in root formation.

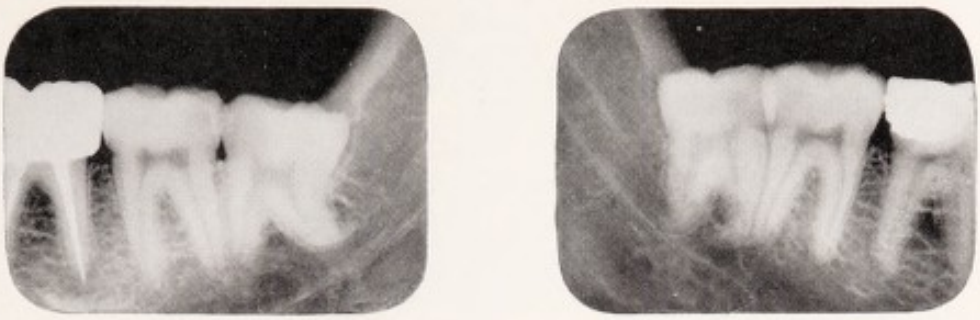


Fig. 123.—Divergent Roots — Distoangular Impaction. Distoangular type of impacted mandibular third molar, showing divergencies in root formation.

Fig. 124.—Divergent Roots — Horizontal Impaction. Horizontal type of impacted mandibular third molar, showing divergencies in root formation.

In these four types of impaction are presented sufficient variation to give the operator an idea of what he may expect to find in a radiogram showing divergencies in root formation.

Extra Root.—Occasionally there may be more than the normal roots on an impacted third molar. The molar may have two distinct mesial or two distal roots, or each of the two roots may be divided, or there may be an extra root extending from the bifurcation. A division of the mesial or distal root is usually indicated in the radiogram by a shadow outlining its presence toward the apical third of the root.

The operator should always bear in mind when interpreting a radiogram the possible presence of an extra root. As it is sometimes difficult to discern an extra root, the operator may fail to observe it, and he will not learn, until he becomes proficient in the diagnosis of such a case, of the presence of an extra root until after the extraction of the tooth.

An extra root will increase the amount of resistance to an extent greater than that which would be ordinarily expected, and the operator will be working at a disadvantage if he is not cognizant of the prevailing condition. If in such a case a fracture of a normal or extra root occurs, which incident is determined by examining the extracted tooth, the operator should immediately determine whether any fractured part of the root has remained in the socket. If a part is left in the socket, it should be removed before the patient recovers

from the anesthetic. If, however, the operator is apprised of the presence of the extra root, he may avoid its fracture; or, if a fracture cannot be avoided, he may so modify his procedure as to cause the most favorable fracture and thereby simplify the operation.

In Fig. 125 is shown an enlarged radiogram of a third molar impacted in a vertical position, with a slight lingual deflection of the crown. The presence of an extra root is shown between the mesial and distal roots.

In Fig. 126 are shown radiograms of a case before and after extraction, and the extracted tooth is also shown. In Fig. 126 A is shown a radiogram of a third molar impacted in a mesioangular position, with a buccolingual deflection of the crown. The roots are short, they appear partially developed and give only slight evidence of the presence of an extra root. In Fig. 126 B is shown a radiogram of the socket after the extraction of the tooth, and in Fig. 126 C is shown the extracted tooth, which reveals a distinct bifurcation of the mesial root.

Fig. 125.—Extra Root — Vertical Impaction. An enlarged radiogram of vertical type of impacted mandibular third molar, with an extra root.

In Fig. 127 is shown a radiogram and the extracted tooth. The divergency of the roots, coupled with the bifurcation of the mesial root, which also shows a divergency and cannot be determined from the radiogram, increases the resistance when the exolever technic is executed, and a fracture of the roots is often unavoidable.

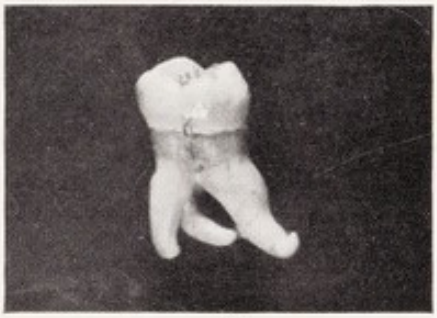
A

B

C

Fig. 126.—Extra Root — Mesioangular Impaction. Same case. *A*, mesioangular type of impacted mandibular third molar, with a buccolingual deflection of crown, roots giving only slight evidence of presence of an extra root; *B*, socket after extraction; *C*, extracted tooth, which reveals a distinct bifurcation of mesial root.

A



B

Fig. 127.—Extra Root—Vertical Impaction. Same case. *A*, vertical type of impacted mandibular third molar; *B*, divergency of roots and bifurcation of mesial root.

Fig. 128.—Extra Root — Mesioangular and Horizontal Impactions. Mesioangular and horizontal types of impacted mandibular third molar where an extra root is shown, varying sufficiently in character to indicate different formations that may be presented.

In Fig. 128 are shown two cases of the impacted mandibular third molar, and they vary sufficiently in character to indicate to the operator the extra root formation that may be found in a radiogram.

Hypercementosed Roots.—Hypercementosis is not often associated with an impacted third molar, but that condition is usually considered present when an extraordinary amount of resistance is encountered or when the tooth is not extracted in its entirety, and when an examination after the extraction discloses the exact condition. The enlargement of the roots will vary in size, and, when present, will cause an unusual amount of resistance during extraction. In a radiogram the roots of a tooth frequently cast a shadow that causes the roots to appear hypercementosed owing to the bifurcation of the mesial or distal root. Increased excision of the ossistructure distal to the crown is indicated when the operator anticipates any extraordinary resistance.

In Fig. 129 is shown an enlarged radiogram of an impacted third molar with roots affected by hypercementosis.

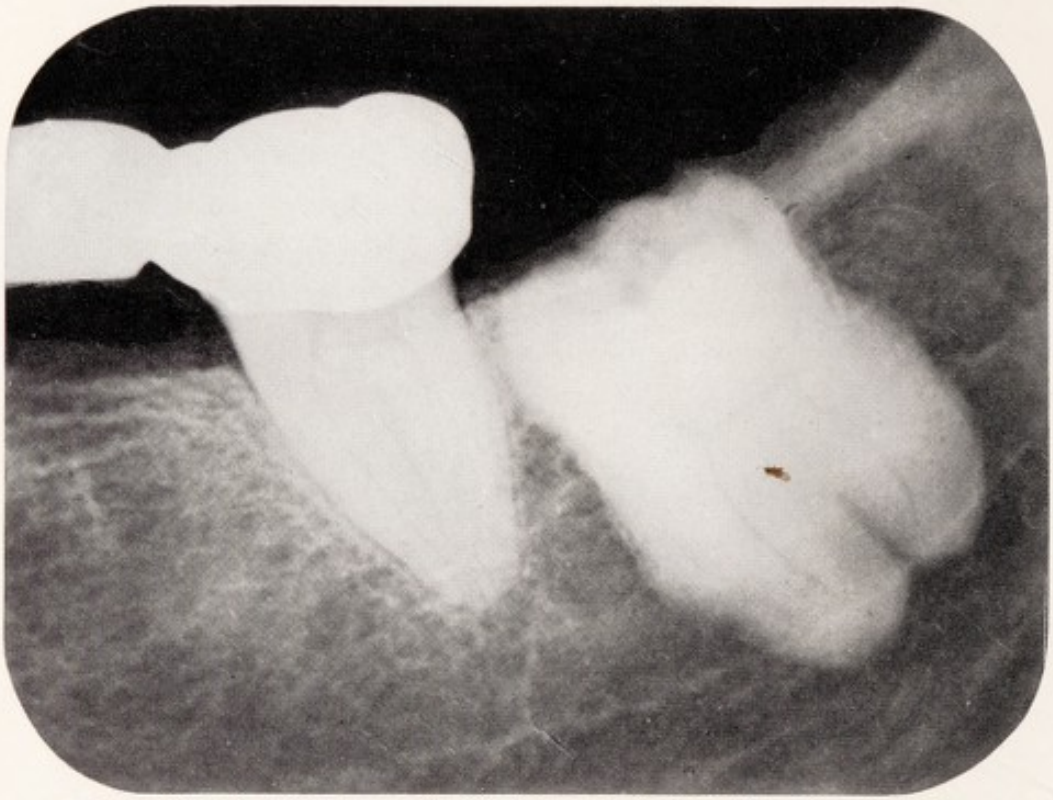
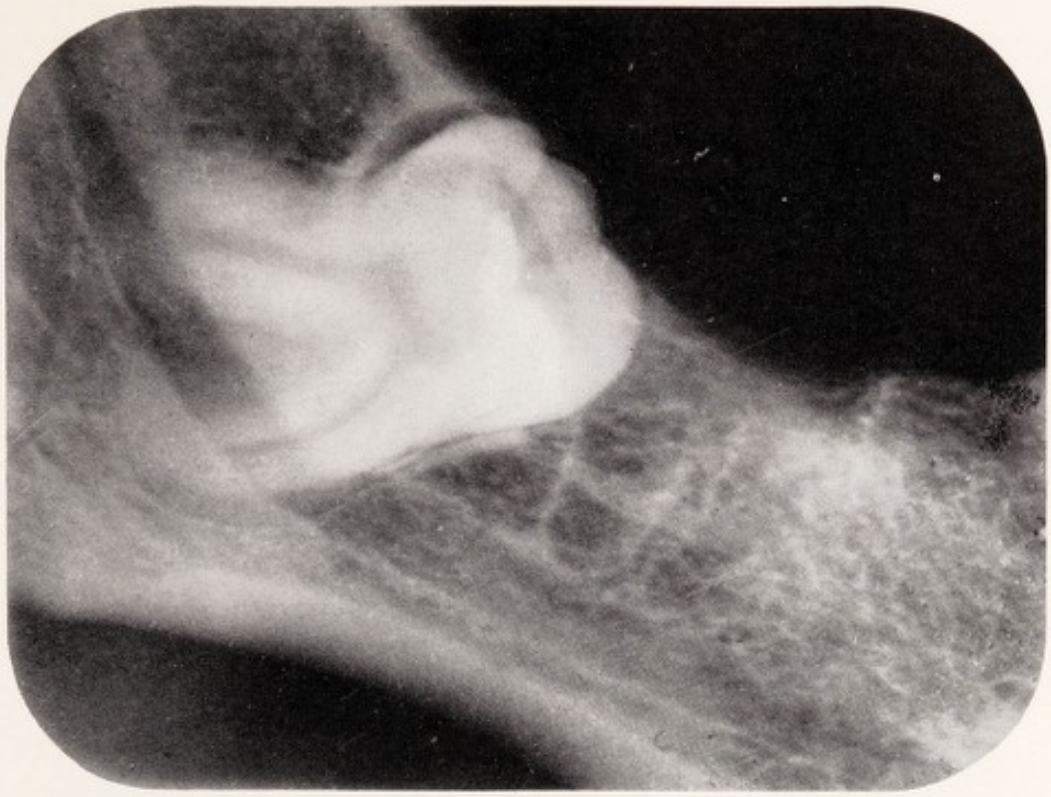
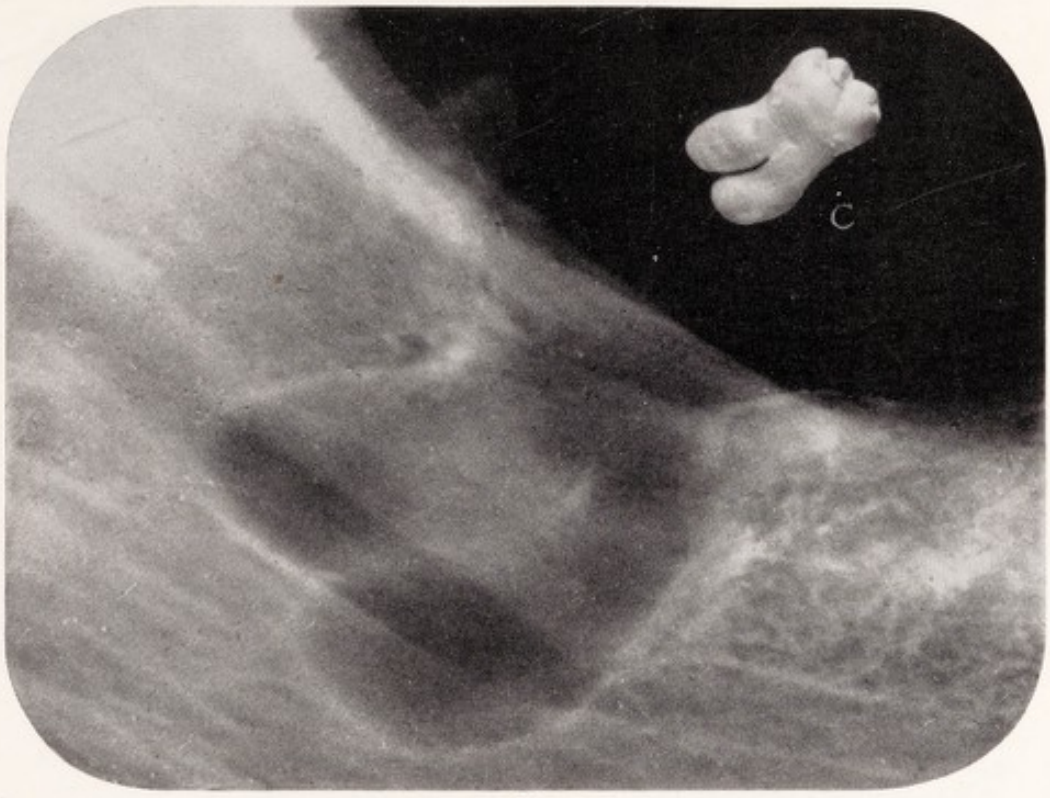


Fig. 129.—Hypercementosed Roots. An enlarged radiogram of an impacted mandibular third molar where roots are affected by hypercementosis.

In Fig. 130 are shown two enlarged radiograms and the extracted tooth. In Fig. 130 A is shown an enlarged radiogram of an isolated impacted third molar, with a slight lingual deflection of the crown. The radiogram in cases of this character will not always present the prevailing condition, as the hypercementosed condition will, in some cases, not be of sufficient density to cast a shadow that will bring out the detail as shown in the illustrations. In Fig. 130 B the socket formation is definitely outlined. In Fig. 130 C is shown the extracted tooth, and the enlargement of the roots is readily noticeable.



A



B

Fig. 130.—Hypercementosed Roots — Isolated Position. Same case. *A*, enlarged radiogram of isolated impacted mandibular third molar, with slight lingual deflection of crown and hypercementosed roots; *B*, socket formation definitely outlined; *C*, extracted tooth, and enlargement of roots readily noticeable.

In Fig. 131 are shown two radiograms of cases where hypercementosis has involved the roots, and these cases are of sufficient variation to give a good idea of the condition that may be presented.

Roots Remaining.—Where caries has destroyed the crown of the impacted tooth to such an extent that only the roots remain, or where the roots remain as the result of a previous attempt at extraction, the radiogram of the case should be interpreted to determine their size, formation and position, and also to learn the condition of the ossistructure supporting the roots. The particular technic to be followed will depend (1) on whether the roots are fused or bifurcated, or, where only one root remains, whether it is the mesial or distal root, and (2) on a determination of its size and relation to the second molar and the supporting ossistructure.

Fig. 131.—Hypercementosed Roots. Impacted mandibular third molar where hypercementosis has involved roots.

Fig. 132.—Roots Remaining — Vertical Impaction. Roots of vertical type of impacted mandibular third molar, showing variation in relation of roots to distal surface of second molar.

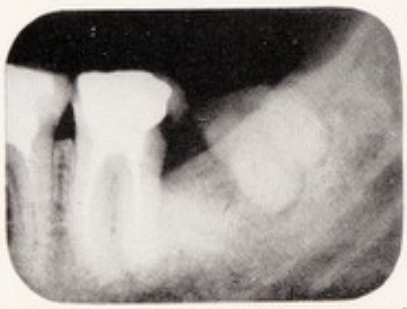


Fig. 133.—Roots Remaining — Mesioangular Impaction. Roots of mesioangular type of impacted mandibular third molar, showing variation in relation of roots to distal surface of second molar.

In Fig. 132 are shown two types of vertical impaction, and in Fig. 133 are shown two types of mesioangular impaction.

In Fig. 134 are shown radiograms of a case before and after extraction and also the extracted roots. In Fig. 134 A is shown a radiogram of a distoangular impaction, where the roots remain as the result of an attempt to extract the tooth, which is one of the most difficult types

of roots to extract on account of the difficulty of access. In Fig. 134 B is shown a radiogram of the case after extraction of the roots, and in Fig. 134 C is shown the extracted roots.

A

B

C

Fig. 134.—Roots Remaining — Distoangular Impaction. Same case. *A*, remaining roots in an attempted extraction of an impacted mandibular third molar in a distoangular position; *B*, socket after extraction; *C*, photograph of roots.

Fig. 135.—Roots Remaining — Horizontal Impaction. Roots of horizontal type of impacted mandibular third molar, showing variation in relation of roots to distal surface of second molar.

Fig. 136.—Roots Remaining — Isolated Position. Roots of isolated type of impacted mandibular third molar.

In Fig. 135 are shown two types of horizontal impaction, and in Fig. 136 are shown two types of isolated impaction. In the five types shown the operator should be able to determine whether the mesial

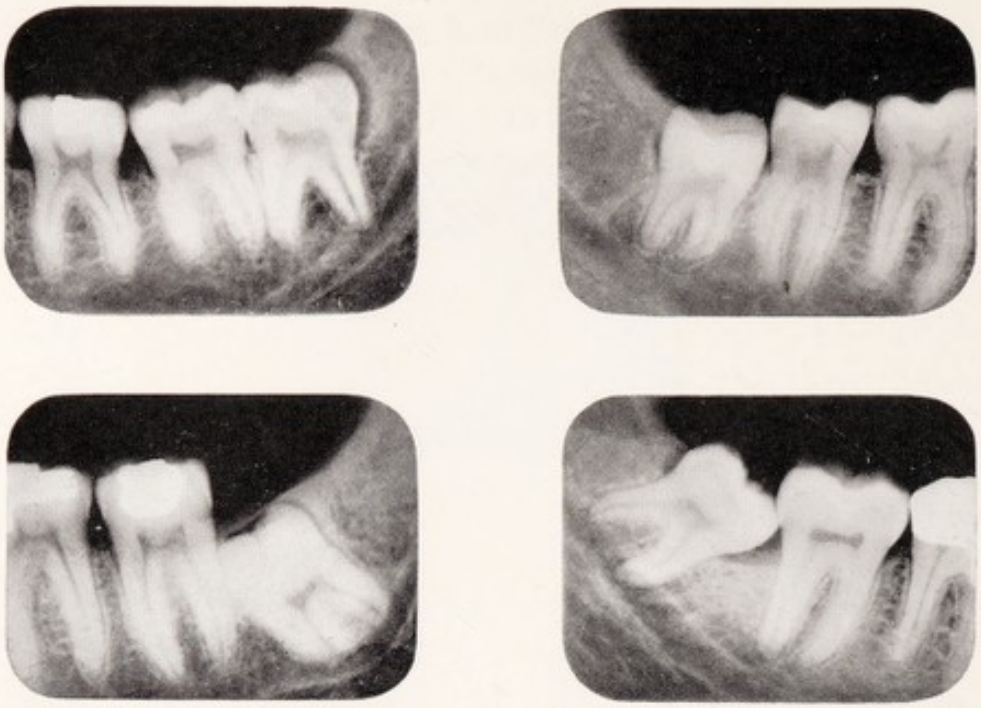


Fig. 137.—Location of Bifurcation of Roots. Vertical and mesioangular types of impacted mandibular third molar, showing variation in location of bifurcation of roots that may be presented.

surface of the mesial root is accessible or inaccessible to the application of the exolever. There is a variation in the position of the roots in their relation to the distal surface of the second molar.

Location of Bifurcation of Roots.—Where the roots of the third molar are not fused and are separated, a study should be made from the radiogram of the character of the bifurcation, as its location will vary in different cases. In some cases of a vertical or an angular impaction, after the exolever has been applied to the mesial surface to direct the tooth distally and to release it partially from its impacted position as far as conditions will permit, being governed by the root formation, the application of the exolever technic on the buccal surface at the bifurcation is very often indicated for the final extraction, the ossistructure on the buccal surface being utilized as a fulcrum.

The object of adjusting the exolever to the buccal surface is to have the point of the blade of the instrument reach the bifurcation whereever possible so as to secure a purchase at this point and to send the blade in such a direction as will produce a tractile movement upward in line with the axis of the tooth, the ossistructure being used buccal to the third molar as a fulcrum.

Where the bifurcation is below the superior border of the ossistructure in a vertical or an angular impaction, being inaccessible to the application of the exolever, and a buccal application is indicated, it is advisable, where the bifurcation cannot be directed up to the superior border of the ossistructure by the pressure applied with an exolever

to the mesial or mesiobuccal surface, to excise enough of the ossistructure on the buccal surface to allow the instrument to reach the bifurcation and be properly applied.

In Fig. 137 are shown four types of vertical and angular impactions, illustrating the variations in the location of the bifurcation of the roots that may be presented. The location of the bifurcation should be compared in each case with the superior border of the ossistructure.

Roots Partially Developed.—In Fig. 138 are shown two cases where the roots of the impacted third molar are partially developed, and in these cases less resistance will be encountered during extraction than where the roots are fully developed. Where an interpretation of the radiogram indicates that the impacted tooth will not assume its normal position, its extraction should follow, so that it may not endanger or disarrange the occlusion of the second molar. When the operative procedure is undertaken, there will be a lack of stability of the ossistructure, in which case it will not make as dependable a fulcrum as where it is in a normal condition and sufficiently strong to support the exolever.

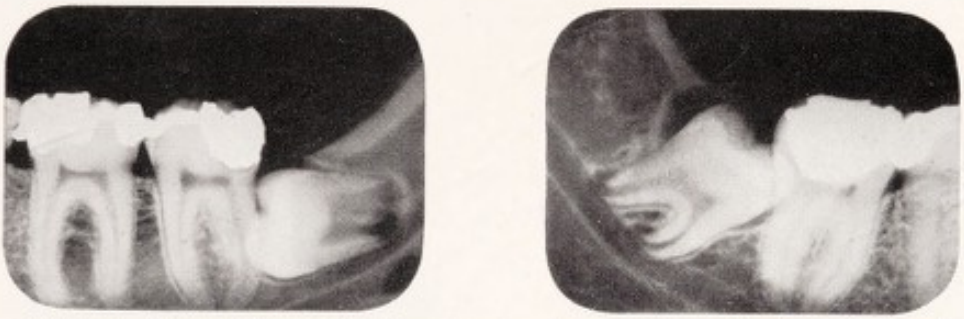


Fig. 138.—Roots Partially Developed. Impacted mandibular third molar where roots are partially developed.

Defining Root Formation.—The value of defining the root formation of an impacted third molar is illustrated in the case of linguoangular impaction shown in Fig. 139. In Fig. 139 A the radiogram shows the occlusal surface of the third molar deflected lingually with only a small part of the roots defined. The first and second molars are in normal alignment, showing definite enamel caps and pulp chambers, but no part of the occlusal surface is visible. In Fig. 139 B is shown a radiogram of the same case, but the x-ray cone was directed downward at an angle as when making a radiogram of a maxillary first molar, which presents approximately the definition of the root formation.

In Fig. 139 C is shown the extracted tooth, which should be compared with the radiogram. These illustrations will enable the operator to make a comparison of the various points presented and to understand the importance of obtaining a correct definition of the root formation. When the exolever technic was executed in this case, the root

A

B

C

Fig. 139.—Root Formation — Linguoangular Impaction. Same case. *A*, linguoangular type of impacted mandibular third molar where greater part of occlusal surface of tooth is visible and only a small part of root formation detailed; *B*, approximately exact root formation; *C*, extracted tooth, which should be compared with two radiograms.

formation was definitely fixed in the mind of the operator, and the tooth was extracted without fracturing the crown or roots.

Contact of Roots.—In the vertical and distoangular types of impaction there will be cases where the mesial surface of the mesial root of the third molar is in contact with the distal or distobuccal surface of the distal root of the second molar. Where there is such contact, the pressure of the mesial root of the third molar against the distal root of the second often has a tendency to force the latter tooth upward, so that its occlusal surface is out of alignment with the corresponding surface of the first molar. In all cases of this character the radiogram should be carefully studied, as in an occasional case there will be an absorption on the distal surface of the distal root of the second molar caused by the pressure of the mesial root of the third.

Where there is a marked contact of the mesial surface of the mesial root of the third molar with the distal surface of the distal root of the second, the mesial surface of the third molar will often be deflected to a slight extent distally to the distal surface of the second molar and the interproximal space between these two teeth will vary in size. In such a case there may be a buccal deflection of the crown of the third molar, which cannot be determined by a lingual radiogram, as there will be no shadow on the distobuccal surface of the second molar on account of the space created by the contact of the roots.

In these cases, after the necessary excision of the ossistructure has been made, the exolever is adjusted, but care should be taken that unnecessary pressure in the execution of the exolever movements does not dislodge the second molar.

In Fig. 140 are shown two radiograms of vertical impaction where the mesial surface of the mesial root of the third molar is in contact with the distal surface of the distal root of the second.

Fig. 140.—Contact of Mesial Root of Third Molar with Distal Root of Second Molar—Vertical Impaction. Mesial surface of mesial root of third molar in contact with distal surface of distal root of second.

In Fig. 141 are shown two radiograms of distoangular impaction where the mesial surface of the mesial root of the third molar is in contact with the distal surface of the distal root of the second.

Fig. 141.—Contact of Mesial Root of Third Molar with Distal Root of Second Molar—Distoangular Impaction. Mesial surface of mesial root of third molar in contact with distal surface of distal root of second.

CHAPTER VII

Radiographic Interpretation of the Ossistructure of the Impacted Mandibular Third Molar

AFTER the crown and roots of the impacted mandibular third molar have been interpreted in the radiogram, the ossistructure surrounding the tooth should also be interpreted to determine whether it will interfere with the extraction of the tooth, as the ossistructure is an important factor in the resistance that may be encountered when the extraction of the tooth is attempted. The ossistructure should be studied in the radiogram with a view to determining the point of resistance and decreasing such resistance by excision at the point most favorable for the technic to be employed. It was found that with the use of the exolever less excision of the ossistructure was necessary than when any other operative procedure was followed. The extent of excision of the ossistructure that may be necessary should be definitely determined, the object being to conserve as much of this structure as possible and not to excise more than is indicated by the type of impaction.

The excision of the ossistructure with a bur consumed a great deal of time, and the longer the bur was used in a case the more trauma resulted. Experience has shown that this procedure is not practicable in an endeavor to gain access for the instrument to be used in the extraction, and, besides, the clogging of the bur increased with each revolution. The necessity of making extensive incision of the gum tissue, the difficulty of retracting it, and its coming in contact with the bur was an annoying and destructive procedure. In addition to this complicated condition, no dependence could be placed on the area burred away, as a deep groove was cut that made it impossible to use the ossistructure as a fulcrum. Using a long-handled chisel and mallet to excise the ossistructure from the larger part of the buccal surface also consumed considerable time, with no other result than continued excision until the tooth could be lifted from its position, which procedure caused a great deal of trauma in the area where excision was difficult and unnecessary, and the post-operative discomfort was often beyond the endurance of the patient.

The ideal method of excising the ossistructure when indicated in the radiogram is to limit the excision to such an area as will be required by the exolever technic to be followed, with the view of

excising only so much of the structure as may be necessary to permit the movements with the exolever and not cause any unnecessary trauma. In order to obtain this result, the ossistructure supporting the impacted tooth should be analyzed in the radiogram in advance of the operation; and the more attention that is given to the detail in the radiogram the less time will be consumed, the less amount of trauma will be caused and the less nervous energy will be expended by both the patient and operator, and, in addition to these factors, the postoperative discomfort that has usually followed the extraction of the tooth will be reduced to a minimum.

When analyzing the ossistructure, the operator should take into consideration the age of the patient, as the more advanced the age the less yielding will be the ossistructure. Any pathologic involvement of the ossistructure should be noted, and an effort made tc ascertain whether the involvement is favorable for the excision of the ossistructure and for the application of the exolever. The part of the ossistructure that may be available as a fulcrum should be determined, and should be used for that purpose instead of the second molar where conditions indicate such a procedure.

APPROXIMATELY NORMAL CONDITION

Where the mandibular third molar is not impacted, a radiogram of the tooth and its supporting ossistructure will show the mesial, distal, lingual and buccal surfaces to be free of ossistructure to the gingival third of the tooth. The absence of ossistructure on these surfaces will allow the free application of the beaks of the forceps (if such an instrument is the choice of the operator) to the buccal and lingual surfaces, or will allow the free application of the exolever (if such an instrument is the choice of the operator) to the mesial and buccal surfaces.

In Fig. 142 are shown two types of the approximately normal mandibular third molar as an example, so that the operator may readily distinguish any deviation from a normal condition. The

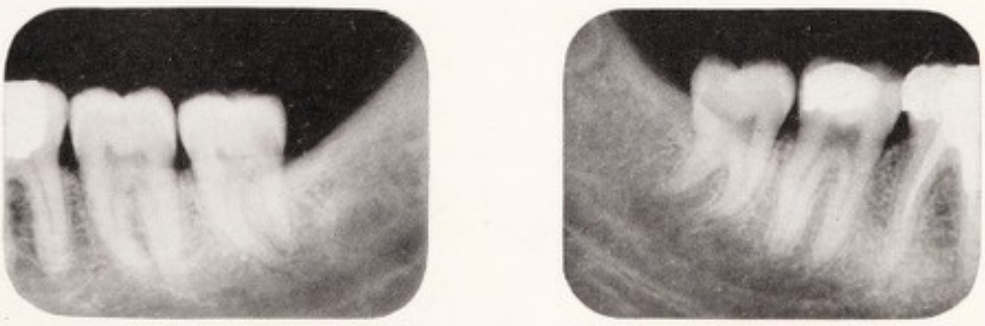


Fig. 142.—Ossistructure — Approximately Normal Condition. Approximately normal third molar, with variation in root formation, but ossistructure does not extend beyond gingival third.

cases shown have a variation in the root formation, but the ossistructure in any of the cases does not extend beyond the gingival third, indicating that an extraction movement can be executed in conformity with the root formation without any excision of the ossistructure.

ABNORMAL CONDITION

Where the ossistructure extends beyond the gingival third, and is so located that it will interfere with the application of the instrument or with the execution of the exolever movements, taking into consideration the position of the crown, the character of the root formation and the position of the second molar, the excision of the ossistructure at the most favorable point for the extraction of the tooth will be indicated. This procedure should be followed in order that there will not be any interference with the application of the instrument for the extraction, nor any unusual resistance to be overcome when the extraction movements are applied or the movements for the final delivery of the tooth are made, so that the tooth may be extracted without injury to the gum tissue or ossistructure, without the liability of a fracture of the crown or roots and without injury to the second molar.

A careful study should be made from the radiogram of each diagnostic point pertaining to the ossistructure in order to determine in advance to what extent the existing condition approximates normal or abnormal, as the case may be, so that the operator may know, if excision is necessary, where and how much of the ossistructure should be excised in order to extract the tooth with as few applications as possible of the instrument to be used and with minimum injury to the surrounding parts. When determining the character of the excision of the ossistructure to be made, the operator should take into consideration the position of the crown, the nature of the root formation and the exolever technic that is to be executed, including a survey of the interproximal space between the second and third molars, the surfaces of the tooth that are to be engaged by the blade of the exolever, the direction and distance of the tooth movements to be made with that instrument, and the structure that can be used as a fulcrum.

The operator can, by a study of the radiogram, determine in advance of the operative procedure to what extent the ossistructure will be a resistant factor in the extraction of the tooth. This knowledge will obviate an explorative examination, and will at the same time eliminate all guesswork in connection with the excision of the ossistructure.

There are cases where excision of the ossistructure will be made to

gain access for the application of the exolever to the mesial or buccal surface, but such cases should be distinguished from those where immediate access can be obtained without any excision. Excision is also made to allow exolever movements to be made in conformity with the root formation, and the diagnosis of the ossistructure should include a survey of the character of the root formation and the position of the tooth. Any pathologic condition of the ossistructure that may be observable—mesial, distal, lingual or buccal—should also be considered.

In order to emphasize the importance of the features to which reference has been made above, a detailed description of each diagnostic point pertaining to the ossistructure is given herewith.

INTERSEPTUM BETWEEN THE SECOND AND THIRD MOLARS

The interseptum is the ossistructure between the distal root of the second molar and the mesial root of the third. The interseptum should be carefully studied in the radiogram as to size and as a factor in supporting the two molars, and also to determine whether it will interfere with the application of the exolever to the mesial surface of the third molar, whether it can be used, when indicated, as a fulcrum for the exolever and whether it is liable to be disturbed during the extraction of the third molar, as a disturbance of the interseptum should be avoided for the reason that it is a factor in the support of the second molar after the extraction of the impacted third.

Vertical Impaction.—Where the third molar is impacted in a vertical position, the interseptum between the second and third molars will be similar to the interseptum where the third molar is not impacted, with a variation according to the position of the impacted tooth. The various positions that may be assumed by the crown of the third molar in its relation to the distal surface of the second demand that close attention be given to the interseptum between the second and third molars.

In Fig. 143 are shown four types of the mandibular third molar impacted in a vertical position, presenting some of the variations to be found in the interseptum between the second and third molars where the latter tooth is in a vertical position. In Fig. 143 A the interseptum is approximately normal. In Fig. 143 B the interseptum is practically obliterated by the position of the third molar, and the mesial root of the third molar is in close contact with the distal root of the second. In Fig. 143 C the interseptum is not very large at the gingival third, but is larger at the apical third. In Fig. 143 D

the interseptum is very large, and the space between the second and third molars will permit the interseptum to be used to support the exolever when applying the instrument to the mesiobuccal surface of the third molar.

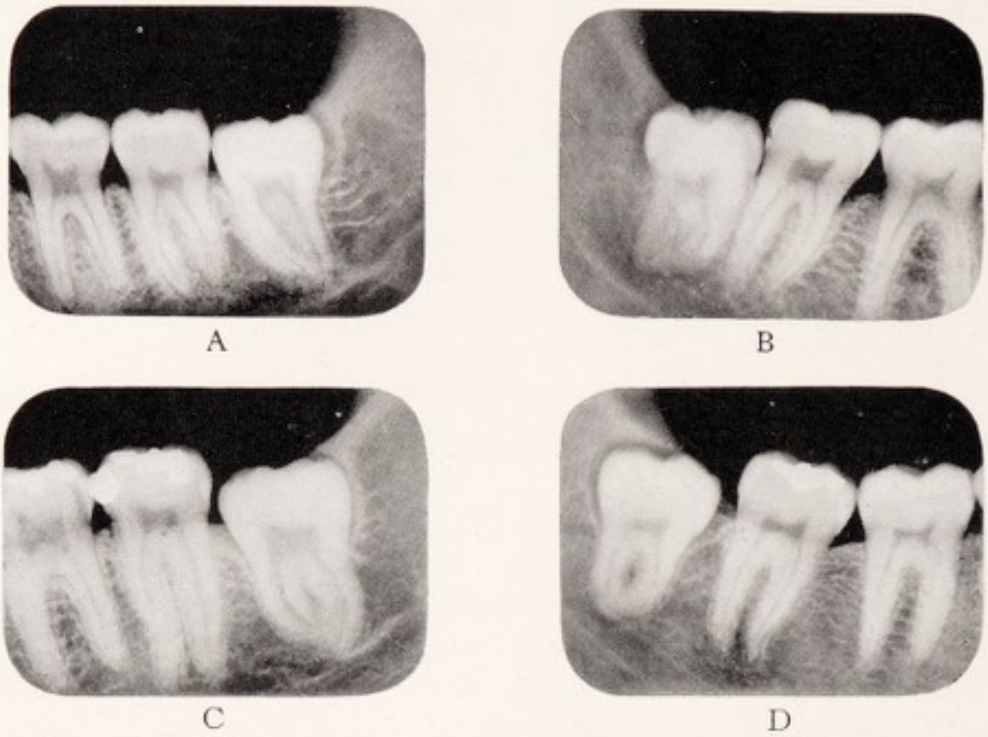


Fig. 143.—Interseptum Between Mandibular Second and Third Molars —Vertical Impaction. Vertical type of impacted mandibular third molar, showing some of variations that may be found in interseptum between second and third molars.

Mesioangular Impaction.—Where the third molar is impacted in a mesioangular position and the mesial surface is above the superior border of the ossistructure, the angulation of the tooth in some cases will present a larger interseptum, which will make an ideal fulcrum for the exolever and avoid the use of the second molar for this purpose. Where the mesial surface of the third molar is below the superior border of the ossistructure, the interseptum will be smaller. The size of the interseptum will vary in different cases, depending on the position of the third molar and the presence of a pathologic condition between the second and third molars.

In Fig. 144 are shown four types of the mandibular third molar impacted in a mesioangular position, presenting some of the variations to be found in the interseptum between the second and third molars when the latter tooth is in a mesioangular position.

In Fig. 144 A there is a large interseptum between the second and third molars. This structure should be utilized in this type of a case as a fulcrum for the exolever when that instrument is applied to the mesial surface of the third molar to direct the tooth distally, and the size of the surface available as a fulcrum should be determined in the radiogram.

In Fig. 144 B the interseptum is similar to that shown in Fig. 144 A, except that the contact of the third molar is at the gingival third of the second molar.

In Fig. 144 C a part of the interseptum is obliterated at the gingival third by the contact of the mesial surface of the third molar with the distal surface of the distal root of the second. At the apical third a large interseptum is present.

In Fig. 144 D the condition is similar to that shown in Fig. 144 C, except that the contact of the mesial surface of the third molar with the distal root of the second is lower and has obliterated the interseptum at the gingival third of the distal root of the third molar to a greater extent than is the case in Fig. 144 C.

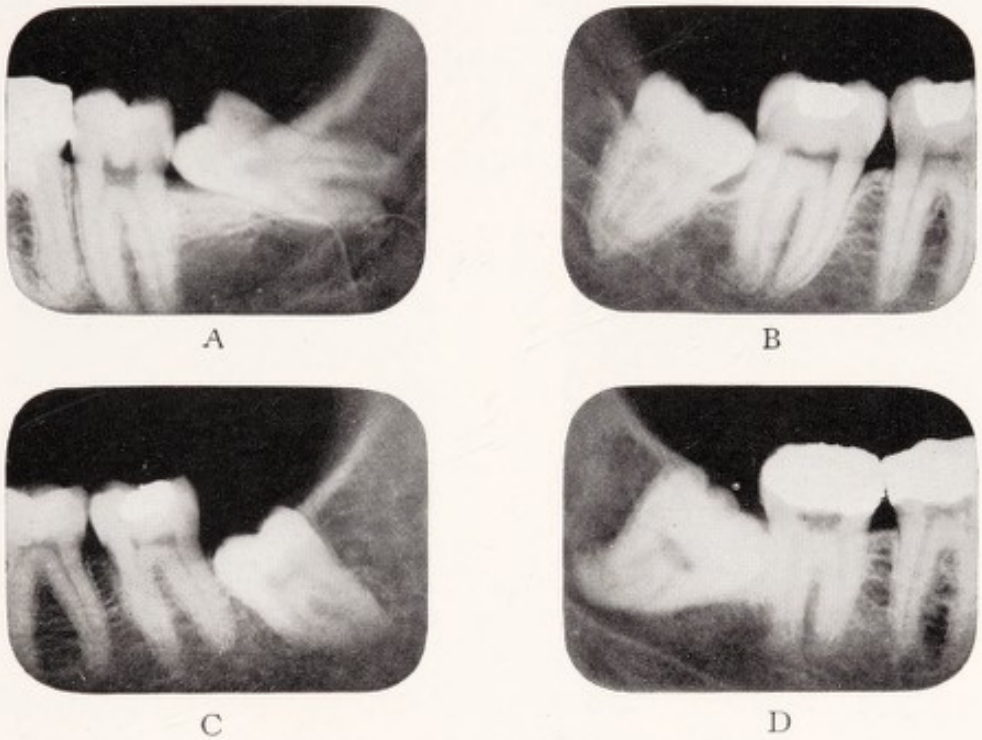


Fig. 144.—Interseptum Between Mandibular Second and Third Molars —Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, showing some of variations that may be found in interseptum between second and third molars.

Distoangular Impaction.—Where the third molar is impacted in a distoangular position, the size of the interseptum between the second and third molars has a tendency to vary according to the degree of angulation of the third molar. In proportion as the interseptum increases in size at the gingival third of the second and third molars, it decreases in size at the apical third, and the mesial root of the third molar will often obliterate the interseptum by its contact with the distal root of the second. The farther the third molar is inclined distally the greater will be the size of the interseptum at the gingival third of the second.

In Fig. 145 are shown four types of the mandibular third molar impacted in a distoangular position, presenting some of the variations to be found in the interseptum between the second and third molars when the latter tooth is in a distoangular position.

In Fig. 145 A the interseptum is similar to the cases where the tooth is in a vertical position; in Fig. 145 B the interseptum between the second and third molars is almost obliterated; in Fig. 145 C it is obliterated by the mesial root of the third molar, and in Fig. 145 D it is very large at the gingival third and is obliterated at the apical third.

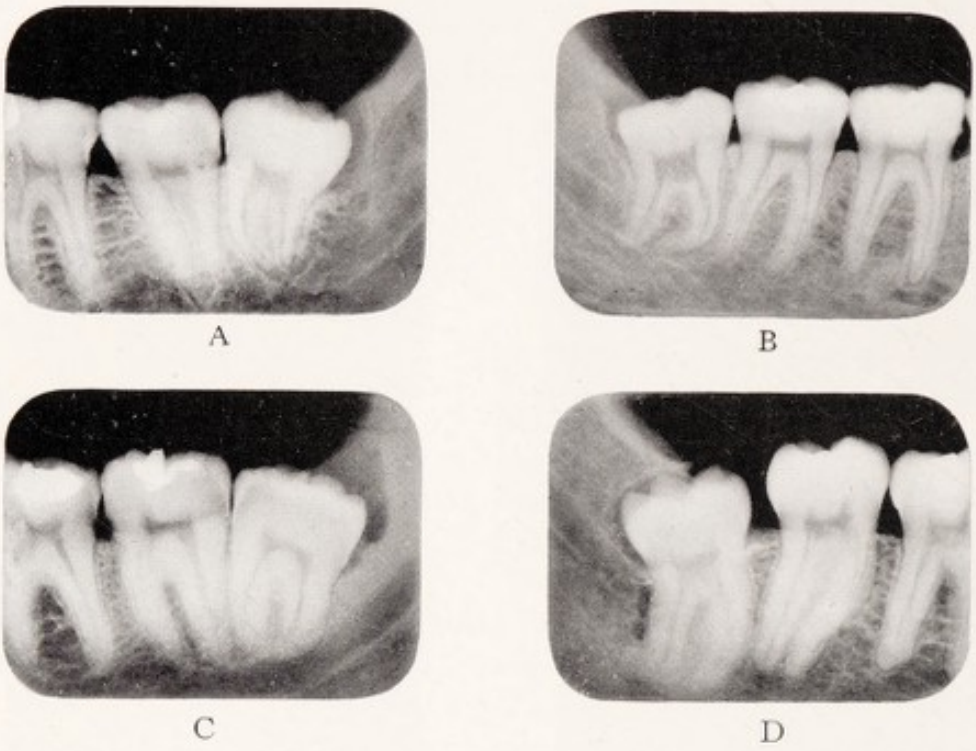


Fig. 145.—Interseptum Between Mandibular Second and Third Molars —Distoangular Impaction. Distoangular type of impacted mandibular third molar, showing some of variations that may be found in interseptum between second and third molars.

Horizontal Impaction.—Where the third molar is in a horizontal position, as in the case where the tooth is in a mesioangular position, the occlusal or mesial surface in contact with the distal surface of the second molar will have a tendency to obliterate the normal interseptum. An abnormal interseptum may be present where there is a space between the occlusal surface of the third molar and the distal surface of the second, and also in a case where there is a pathologic condition below the mesial surface of the third molar.

In Fig. 146 are shown four types of the mandibular third molar impacted in a horizontal position, presenting some of the variations to be found in the interseptum between the second and third molars where the latter tooth is in a horizontal position. In Fig. 146 A the abnormal interseptum has not been obliterated by the occlusal or mesial surface

of the third molar. In Fig. 146 B the abnormal interseptum is obliterated by the contact of the occlusal surface of the third molar with the distal root of the second. In Fig. 146 C there is an interseptum between the occlusal surface of the third molar and the distal surface of the distal root of the second. In Fig. 146 D there is an extremely large abnormal interseptum between the occlusal surface of the third molar and the distal surface of the distal root of the second.

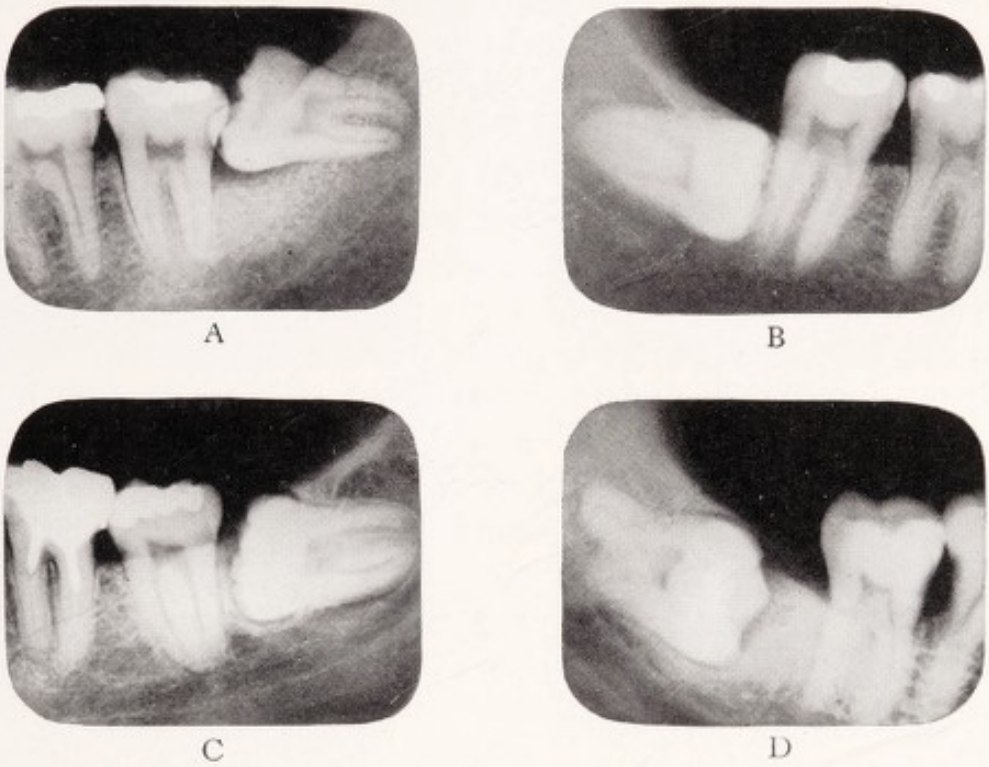


Fig. 146.—Interseptum Between Mandibular Second and Third Molars —Horizontal Impaction. Horizontal type of impacted mandibular third molar, showing some of variations that may be found in interseptum between second and third molars.

Where there is ossistructure between the occlusal surface of the third molar and the distal surface of the distal root of the second, as shown in Fig. 146 C and 146 D, the ossistructure will have a tendency to increase the resistance, according to its size, when the extraction of the tooth is undertaken. Where the interseptum between the occlusal surface of the third molar and the distal surface of the distal root of the second is small, excision will endanger the distal root of the second molar, but, where the interseptum is of the size shown in Fig. 146 D, excision will not cause any injury. In the latter case the ossistructure may serve as a fulcrum, and the operation may be the same as when extracting an isolated impacted tooth in the same position.

SEPTUM BETWEEN THE ROOTS OF THE THIRD MOLAR

A study of the septum, when present, between the mesial and distal roots of the third molar should be made from the radiogram in order to

determine its size and relation to both roots. The resisting factor of the septum has an important bearing on the extraction of the tooth, and the operator should carefully study the septum for the purpose of adopting the most favorable method for overcoming the resistance that may be indicated and to avoid a fracture of either the root or of the crown. An estimate should also be made of the force that may be necessary to apply during the extraction movement, which is governed by the root formation and septum, for, if this is not done, the septum is liable to remain attached to the ossistructure on the lingual surface, carrying with it a part of the lingual plate. This incident can be avoided by a properly applied pressure on the tooth to produce a clean fracture of the septum, when indicated, instead of having the tooth, with a part of the lingual plate attached, carried out of the socket, usually leaving that part of the socket on the lingual surface exposed and rendering it difficult to excise the ossistructure to such an extent that it may be protected by the gum tissue.

It is not unusual to find the roots fused, with no septum between them. A small septum is not, as a rule, very much of a resisting factor, but a medium-sized septum will cause some resistance and should be treated as if it were a large septum. Where the roots of the third molar are widely separated, the septum will be large, and an estimate should be made of the probable degree of resistance that may be encountered during the extraction, as the larger the septum the greater will be the resistance. The operator should not, however, feel timorous concerning the presence of a large septum if he is familiar with the principle of the lever and has properly studied the case, so that the tooth may be extracted in the most favorable direction in accordance with its position and the root formation. If the required amount of excision distal to the crown is not made, it will be difficult to extract the tooth in the direction indicated to produce a clean fracture of the septum.

In the execution of the exolever technic the operator should apply sufficient force to the tooth in a direction most favorable to a fracture of the septum, where indicated, and thereby avoid a fracture of a part of the lingual plate, which occurs so often where an improper force has been exerted. The inexperienced operator may hesitate to apply this force where the septum is heavy, especially where the mesial root is inclined distally and the distal root is inclined mesially.

The advantage of the exolever over the forceps is that with the use of the exolever the resistance of the septum between the roots of the third molar will be overcome. As the roots are usually located in the cancellous structure, the extraction movements, if applied in conformity with the root formation, will produce a clean fracture of the septum,

and in most cases the fracture will occur between the roots of the extracted tooth.

Where there is a torsional deflection of the tooth, the amount of septum between the roots cannot be determined and the resistance of the septum cannot be estimated. Where the roots are markedly separated, but come together at the apical third, and where the ledge of ossistructure is not very heavy on the lingual surface, a fracture of a small part of the lingual plate is unavoidable in some cases.

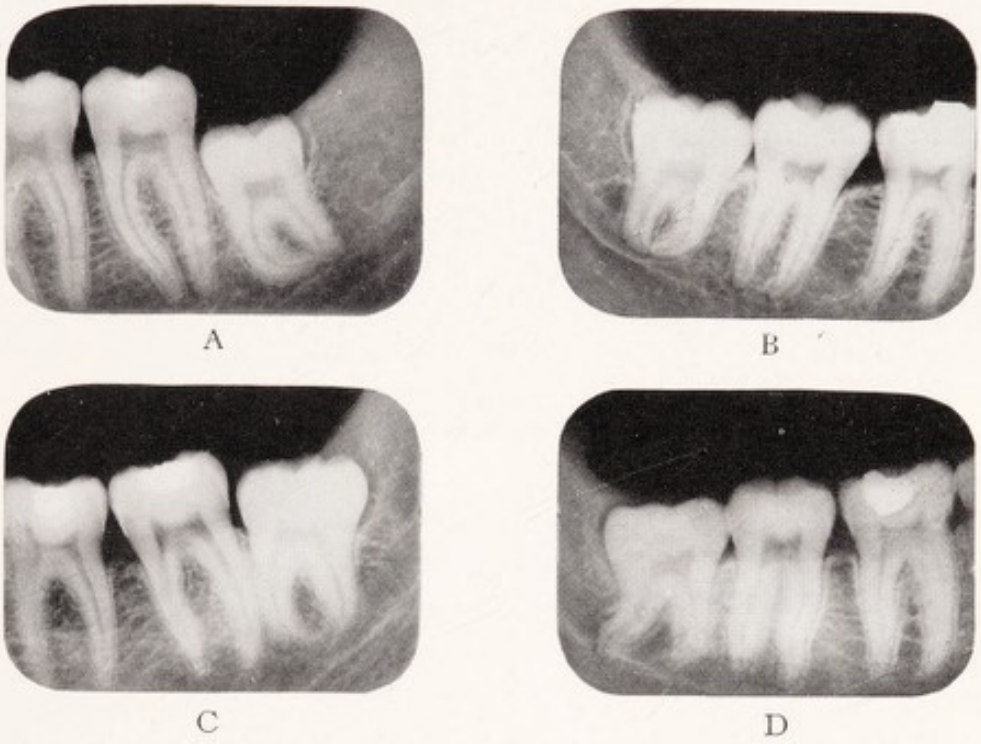


Fig. 147.—Septum Between Roots of Third Molar — Vertical Impaction. Vertical type of impacted mandibular third molar, showing some of variations that may be found in septum between roots of third molar.

Vertical Impaction.—In Fig. 147 are shown four types of the mandibular third molar impacted in a vertical position, presenting the variations to be found in the septum between the roots of the third molar when the latter tooth is in a vertical position.

In Fig. 147 A the septum is very small, and will readily fracture if a proper extraction movement is made after the exolever has been applied.

In Fig. 147 B there is a large septum, indicating that quite an amount of resistance may have to be overcome, and, if such is the case and the extraction technic is not properly applied to produce a clean fracture of the septum, the latter structure will be quite a resisting factor in the extraction of the tooth, whereas, if a clean fracture is produced, the case will be greatly simplified.

In Fig. 147 C the septum is very large and will be quite a resisting factor in the extraction movements. A septum with the roots

formed as shown should be fractured to overcome the resistance, or a fracture of the root may follow.

In Fig. 147 D the septum is of such a character that it cannot be fractured without producing a fracture of the roots, but the extraction movements can nevertheless be made so that the septum will remain intact and the roots will not be fractured.

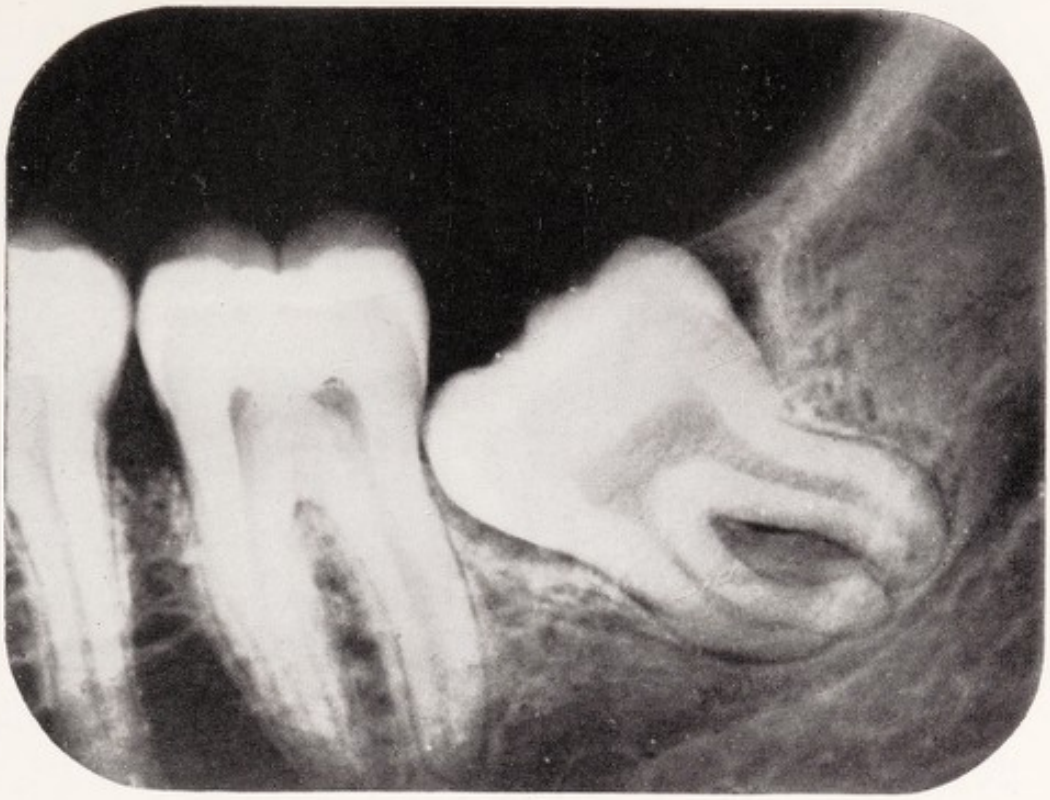
In addition to the general variations to be observed concerning the septum, it should be carefully examined in anticipation of a fracture of the roots, so that, if such a fracture should occur, the character of the septum will govern the operative technic for the extraction of the roots.

Mesioangular Impaction.—In a mesioangular impaction of the third molar the position of the tooth and the available fulcrum are favorable for the adjustment of the exolever and for the application of the necessary force to produce a clean fracture of the septum, so that it will be carried away, leaving the ossistructure intact on the lingual surface. A typical case of this kind, where the operation was often dreaded on account of the position of the tooth and the resisting septum, is shown in the two enlarged radiograms in Fig. 148. In Fig. 148 A a large septum is shown between the mesial and distal roots. In Fig. 148 B is shown the case after the tooth was extracted, with the septum carried away, but the ossistructure on the lingual and buccal sides of the socket remaining intact.

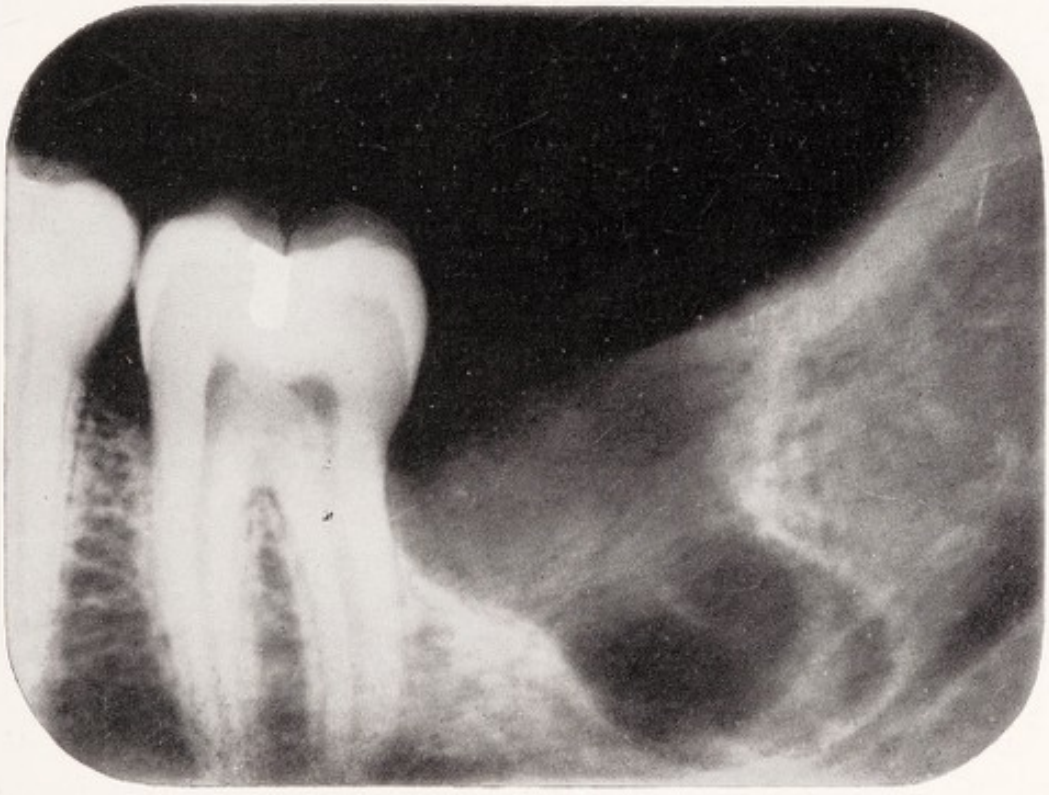
In Fig. 149 are shown four types of the mandibular third molar impacted in a mesioangular position, presenting the variations to be found in the septum between the roots of the third molar when the latter tooth is in a mesioangular position. In this type of case the septum is not, as a rule, the difficult problem that it would be in a vertical type, as the technic for directing the tooth distally in order to overcome the resistance, or to produce a clean fracture of the septum, is more readily accomplished than in a vertical type of impaction for the reason that the distal ossistructure is in most cases more readily accessible.

In Fig. 149 A there is a small septum between the roots. In this case, on account of the ready access to the mesial surface with an exolever to direct the tooth distally, it will be a simpler procedure to produce a clean fracture than it will be to produce a similar fracture in the case of Fig. 149 C on account of the increased excision of the ossistructure that will be necessary on the distal surface and the more difficult character of access with the exolever to the mesial surface.

In Fig. 149 B there is a larger septum than is shown in Fig. 149 A, with a straight mesial root and the distal root inclined mesially,



A



B

Fig. 148.—Septum Between Roots of Third Molar — Mesioangular Impaction. Same case. *A*, enlarged radiogram of mesioangular type of impaction, with a large septum between mesial and distal roots of third molar; *B*, case after tooth was extracted, showing septum carried away and ossistructure on lingual and buccal surfaces remaining intact.

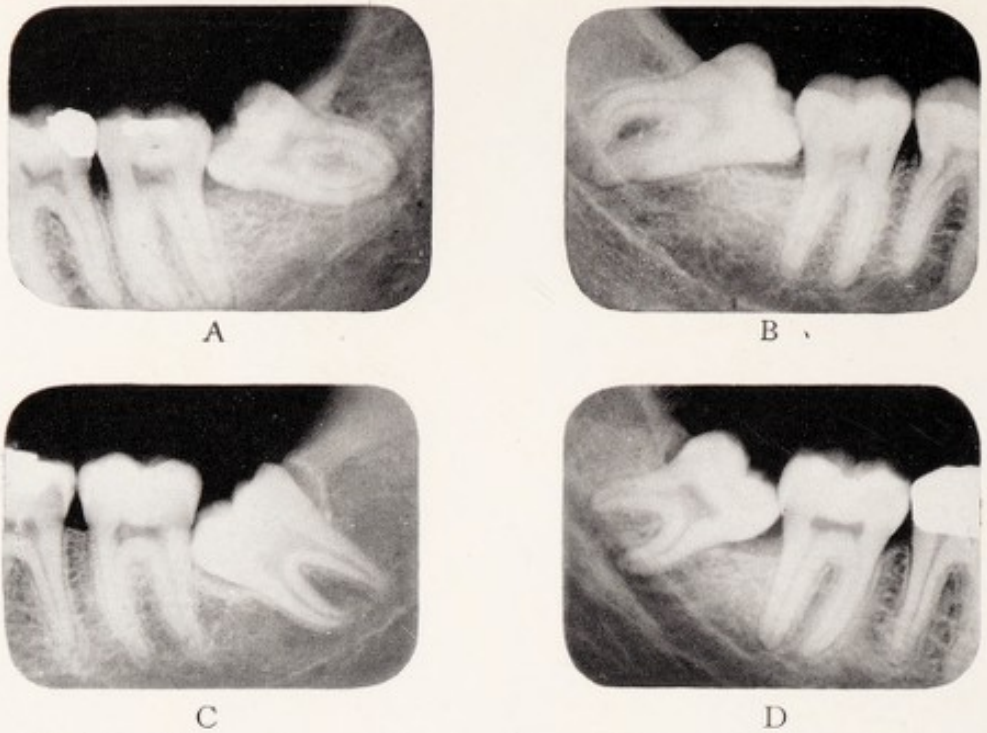


Fig. 149.—Septum Between Roots of Third Molar — Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, showing some of variations that may be found in septum between roots of third molar.

and the septum should be fractured to reduce resistance to the extraction movements. A fracture of the mesial root can be avoided on account of the ready access and by increasing the excision of the ossistructure on the distal surface of the third molar beyond a point that would normally be indicated.

In Fig. 149 C is a type of septum where, if the tooth is directed too far distally, a fracture of the distal root will occur. In this case the tooth should be directed distally only far enough to produce a fracture of the septum and thus avoid a fracture of the roots.

In Fig. 149 D there is a very large septum, which will be difficult to fracture. In this case the roots will fracture if the tooth is directed very far distally. Cases of this kind are rare, and it will be observed that one can apply the exolever without disturbing the septum by excising the ossistructure on the distal surface, directing the tooth to a slight extent distally to clear the distal surface of the second molar, and applying the exolever to the buccal surface for an upward tractile movement.

Distoangular Impaction.—In Fig. 150 are shown four types of the mandibular third molar impacted in a distoangular position, presenting the variations to be found in the septum between the roots of the third molar when that tooth is in a distoangular position. In a case of this kind the septum is the most complicated problem associated with the extraction of this type of impacted third molar, as the contemplated extraction movements to direct the tooth either

distally or lingually in order to produce a fracture of the septum will indicate increased excision of the distal ossistructure, which excision will be difficult to execute on account of the inaccessible position of the tooth. In Fig. 150 A the septum is small and will not be difficult to fracture, as the position of the tooth and root formation are favorable for such a procedure. In Fig. 150 B the procedure to fracture the septum, which should be done in order to extract the tooth, becomes more complicated on account of the position of the tooth, the root formation and the supporting ossistructure. In Fig. 150 C the septum will not be as much of a resisting factor as in Fig. 150 B on account of the more favorable root formation, which will more readily permit the extraction movements to be made. In Fig. 150 D the resistance of the septum is increased on account of the position of the tooth, the character of the root formation and the fact that the greater part of the tooth is surrounded by ossistructure.

Horizontal Impaction.—Where the third molar is impacted in a horizontal position, it will not be so difficult, as a rule, to overcome the resistance of the septum and cause a clean fracture as it will be in some cases of vertical and distoangular impactions. Extraction movements in this type of impaction cannot be made so as to have the septum remain intact as in some cases of vertical, mesioangular and distoangular impactions, as the septum will be fractured away

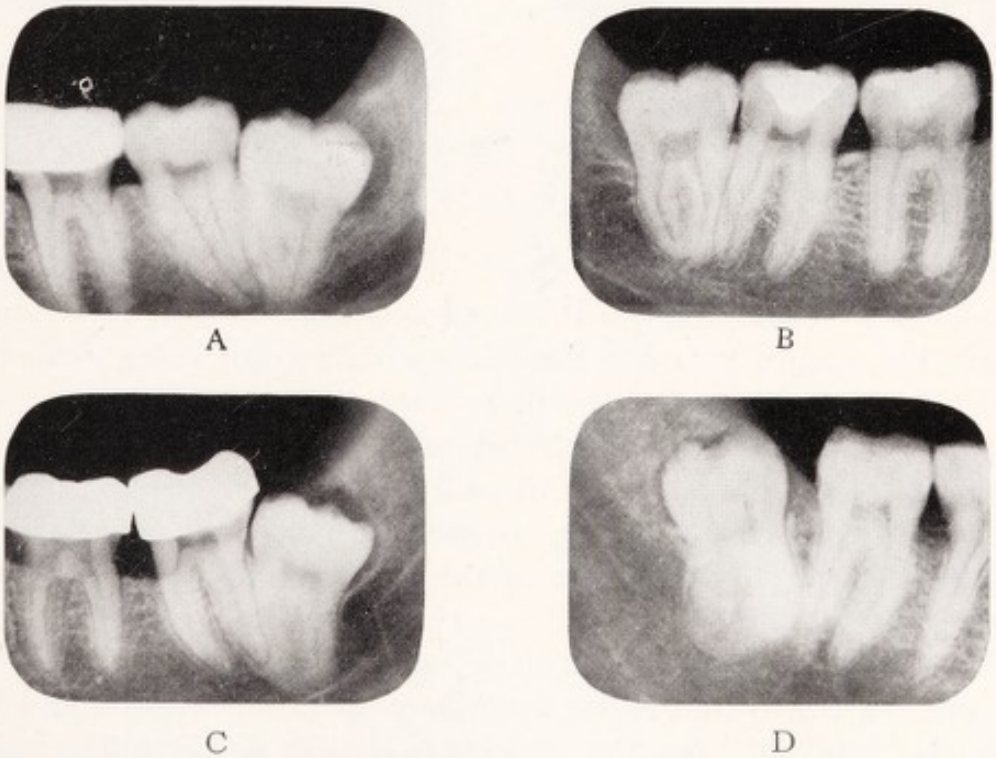


Fig. 150.—Septum Between Roots of Third Molar — Distoangular Impaction. Distoangular type of impacted mandibular third molar, showing some of variations that may be found in septum between roots of third molar.

with the tooth during its extraction. The septum in this type of a case has always been a resisting factor when forceps were used, since, no matter how much ossistructure around the tooth was excised, the resisting septum remained. Since, in the majority of cases of this character the roots are in the cancellous structure, the resistance can be readily overcome by a proper application of the exolever, when the tooth can be extracted in a direction that will be favorable for the fracture of the septum. Where the septum is of a large size and the roots are of sufficient strength to allow a fracture of the septum, less complications are encountered than where the roots are small in circumference and not strong enough to allow a fracture of the septum when the extraction movements are applied.

In Fig. 151 are shown two radiograms of the horizontal type, where the bifurcation is near the apex of the tooth, with both roots small in circumference, and their formation and direction is not so favorable for causing a fracture of the septum in order to avoid a fracture of either root. In such a case the operator may expect a fracture of the roots, and, if such fracture occurs, he should be prepared to extract the roots.

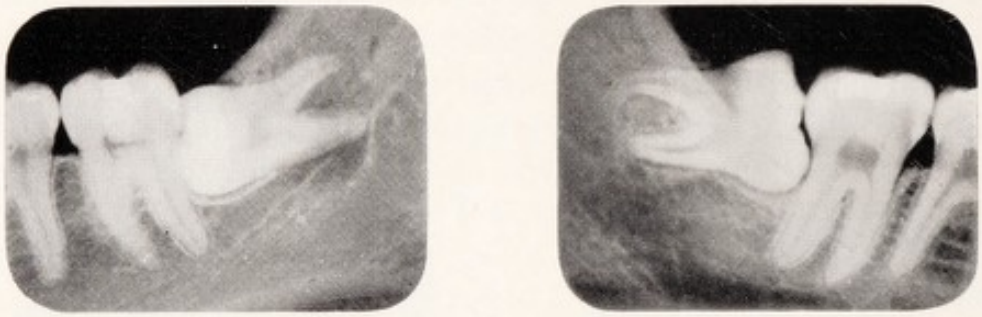


Fig. 151.—Septum Between Roots of Third Molar — Horizontal Impaction. Horizontal type of impacted mandibular third molar, with both roots small in circumference. The formation and direction of roots is not so favorable for a fracture of septum.

In Fig. 152 are shown four types of the mandibular third molar impacted in a horizontal position, presenting the variation to be found in the septum between the roots of the third molar when the tooth is in a horizontal position.

In Fig. 152 A there is a small septum between the roots of the third molar. The root formation and the size of the septum, together with the condition of the ossistructure on the distal surface of the third molar, indicate that in this case the septum will not be a resisting factor.

In Fig. 152 B the septum is a little larger than that shown in Fig. 152 A, and there will be greater resistance to producing a clean fracture of the septum. As the roots are small in circumference, a fracture is liable to occur.

In Fig. 152 C the septum is small, and the roots are deeply imbedded

in the ossistructure. Greater resistance to producing a fracture of the septum may be expected, but the root formation favors a clean fracture.

In Fig. 152 D there is a large septum between two straight roots, presenting a type of case where a fracture of the roots instead of the septum may be expected. The strength of the heavy roots will prove a resisting factor, and considerable pressure must be exerted to overcome the resistance, but a fracture of the roots rarely occurs.

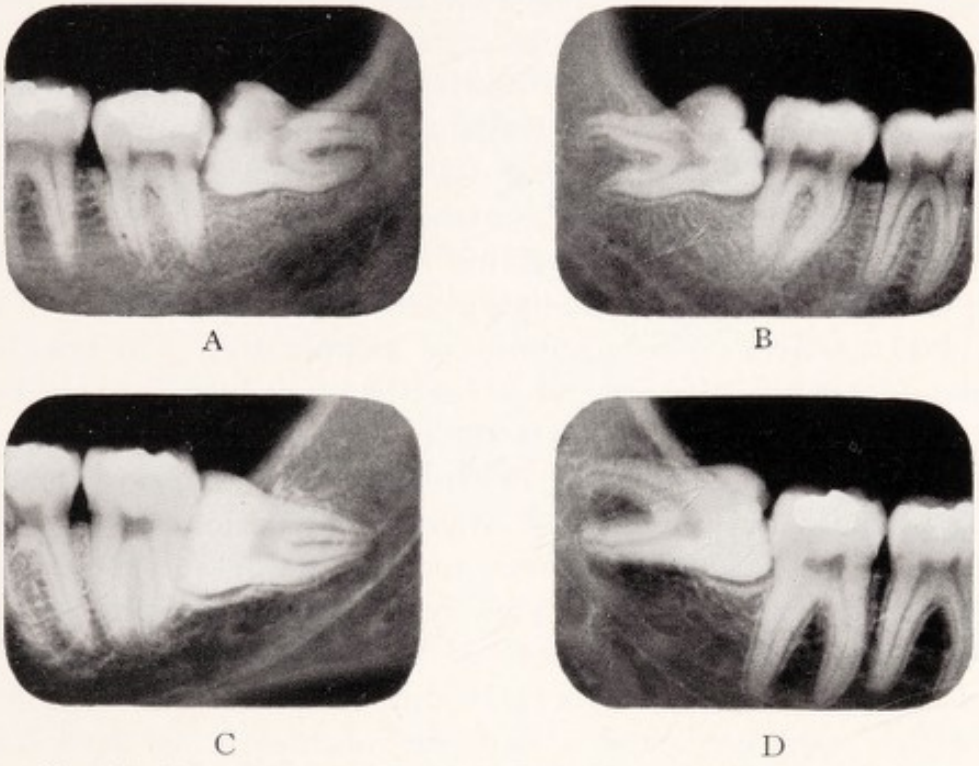


Fig. 152.—Septum Between Roots of Third Molar — Horizontal Impaction. Horizontal type of impacted mandibular third molar, showing some of variations that may be found in septum between roots of third molar.

OSSISTRUCTURE ON THE BUCCAL SURFACE OF THE THIRD MOLAR

The radiogram will show a dense structure more prominently than a light one, and for that reason the ossistructure on the buccal surface of the third molar will not be visible in the radiogram, as it will be entirely obliterated by the denser structure of the tooth. Where the entire crown of the tooth is not imbedded in the ossistructure, the operator must depend on the superior border of the ossistructure mesial and distal to the crown of the third molar as a guide to determine how far the ossistructure extends on the buccal surface of the third molar.

If the operator, when studying the superior border of the ossistructure in the radiogram, will take as a guide the superior border in the region of the first and second molars, following a line distally from the first and second molars to the ossistructure on the distal

surface of the third molar, he will be able to form a good idea of the location of the superior border of the ossistructure on the buccal surface of the third molar.

Where the crown is in a vertical position and the superior border of the ossistructure extends beyond the gingival third and often up to the occlusal surface, an effort to grasp the tooth with forceps will usually result in the instrument slipping from its adjustment, as it is difficult to have the beaks of the forceps cut through or displace the ossistructure extending up beyond the gingival third on the buccal surface of the tooth. If an effort is made to apply an exolever to the buccal surface where the ossistructure extends up to the occlusal surface, there will be a tendency of the instrument to slide down on the side of the supporting ossistructure.

The superior border of the ossistructure on the buccal surface should be carefully examined, as this border will vary, in its alignment in different cases, from the gingival third up to, and often over, the occlusal surface. This preliminary examination will enable the operator to determine the amount of ossistructure buccal to the crown of the third molar, and to estimate the extent of excision that may be necessary to gain access with an instrument to the buccal surface.

In many cases of vertical and angular impaction the extraction movements with forceps have presented to the operator a perplexing problem for the reason that it has always been difficult—in fact, sometimes impossible—to obtain access with forceps. A solution of this problem is the introduction of a technic in which an exolever, instead of forceps, is employed, and a suitable fulcrum is selected for the proper application of the instrument. The ossistructure buccal to the crown of an impacted mandibular third molar will make an ideal fulcrum in the majority of cases.

By locating the alignment of the superior marginal ridge on the buccal surface, the operator will be able to determine the feasibility of making an application of the instrument to that surface when indicated, and can conclude whether any excision of the ossistructure on the buccal surface is necessary, or whether an immediate application of the instrument can be made to that surface and thus avoid any unnecessary excision.

Determining the location of the buccal ossistructure is one of the important diagnostic points for the reason that in quite a percentage of cases where the mandibular third molar is impacted in a vertical or an angular position the application of the exolever is made on the buccal surface at the bifurcation, the contiguous ossistructure being used as a fulcrum for the final extraction of the tooth.

Where the crown of the impacted mandibular third molar is in

alignment with the second molar—that is, where there is neither buccal nor lingual deflection of the tooth—the ossistructure buccal to the crown of the third molar will be of a normal, heavy character, with sufficient ossistructure buccal to the crown to be utilized as a fulcrum. Where the tooth is deflected buccally out of the alignment with the crown of the second molar, the thickness of the ossistructure will be decreased and the difficulty of securing a fulcrum for the exolever will be correspondingly increased.

Where the tooth is deflected lingually, the thickness of the ossistructure on the buccal surface will vary according to the extent of the deflection, and in some cases the ossistructure on the buccal surface will not be heavy enough to allow its use as a fulcrum unless it is excised to a point where a suitable fulcrum can be obtained.

Formerly, in an operation for the extraction of an impacted third molar, the entire ossistructure buccal to the crown was often excised to facilitate the extraction. This method involved a great deal of time and resulted in the excision of the heaviest portion of the structure supporting the tooth, which in the majority of cases was an unnecessary procedure. It is now, however, the correct procedure to excise the ossistructure distal to the crown, and is the logical direction, in the greater number of impactions, in which to direct the tooth, applying a distal and an upward extraction movement. An extraction movement buccally with forceps is not in accord with the character of the root formation, as the ossistructure on the buccal surface will not permit a buccal movement, and any lingual movement will have a tendency to cause a fracture of a part of the lingual plate.

The excision of the ossistructure on the buccal surface is indicated where access to the mesial, mesiobuccal or buccal surface is to be obtained for the application of the exolever, and in that case excision should be limited to a point where the exolever can be applied to the mesial or buccal surface.

The ossistructure on the buccal surface of the impacted tooth is located by drawing an imaginary line on the radiogram from the superior border of the ossistructure on the buccal surface of the first molar, past the second, to the ossistructure on the distal surface of the third molar.

Vertical Impaction.—In Fig. 153 are shown four types of the mandibular third molar impacted in a vertical position, with a dotted line marking the superior border of the ossistructure on the buccal surface. A study of these four types will give a good idea of the variation in the location of the ossistructure in this type of a case, where the superior border of the ossistructure may extend from the gingival third to the occlusal surface.

In Fig. 153 A the superior border of the ossistructure extends up to the gingival third, which leaves the buccal surface free of ossistructure. In Fig. 153 B the superior border of the ossistructure extends slightly beyond the gingival third, and not so much of the buccal surface is free of ossistructure as in Fig. 153 A. In Fig. 153 C the superior border of the ossistructure extends farther beyond the gingival third, and less of the buccal surface is free of ossistructure than in Figs. 153 A and 153 B. In Fig. 153 D the superior border of the ossistructure extends up to the occlusal surface, indicating that the ossistructure extends over the entire buccal surface.

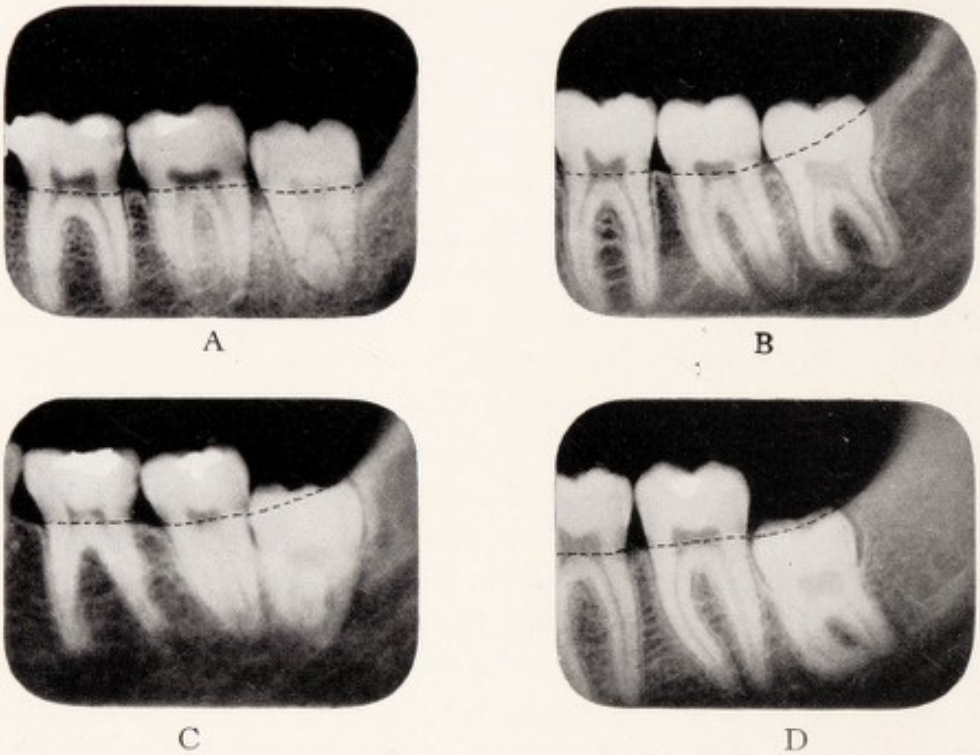


Fig. 153.—Ossistructure on Buccal Surface — Vertical Impaction. Vertical type of impacted mandibular third molar, with a dotted line marking superior border of ossistructure on buccal surface.

Mesioangular Impaction.—In Fig. 154 are shown four types of the mandibular third molar impacted in a mesioangular position, with a dotted line marking the superior border of the ossistructure on the buccal surface. A study of these four types will give a good idea of the variation in the location of the ossistructure in this type of a case, where the superior border of the ossistructure may extend from the gingival third to the occlusal surface.

In Fig. 154 A the superior border of the ossistructure extends up to the gingival third, leaving the buccal surface free of ossistructure. In Fig. 154 B the superior border of the ossistructure extends slightly beyond the gingival third. In Fig. 154 C the superior border of the ossistructure extends almost up to the occlusal surface. In Fig. 154 D the superior border of the ossistructure extends up to the occlusal sur-

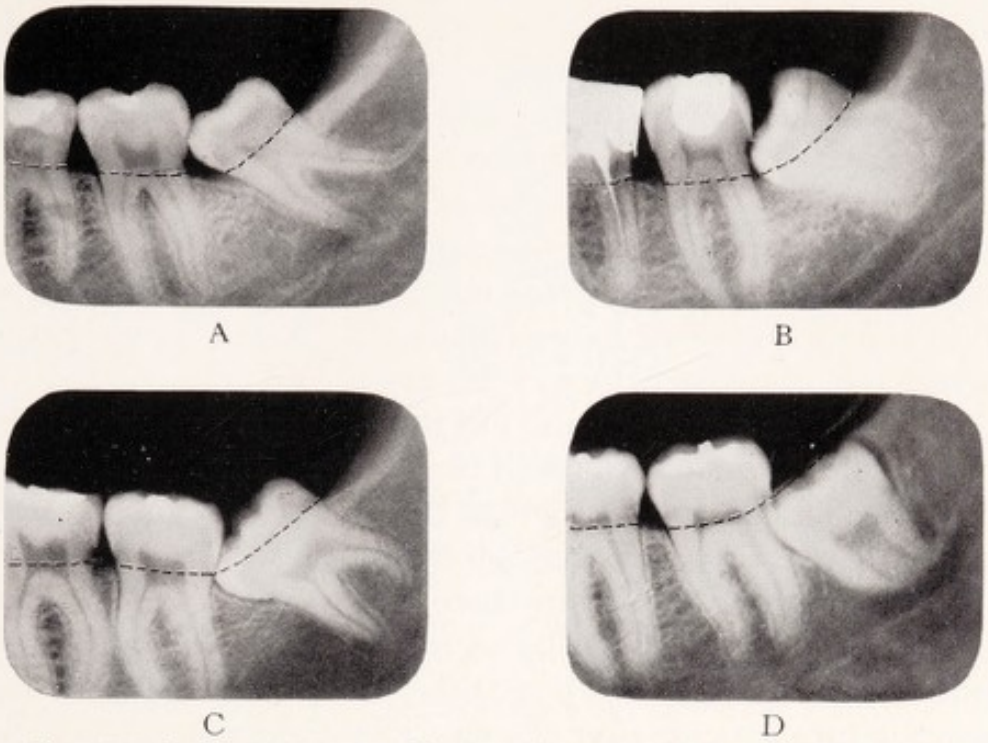


Fig. 154.—Ossistructure on Buccal Surface — Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, with a dotted line marking superior border of ossistructure on buccal surface.

face, indicating that the ossistructure extends over the entire buccal surface.

Distoangular Impaction.—In Fig. 155 are shown four types of the mandibular third molar impacted in a distoangular position, with a dotted line marking the superior border of the ossistructure on the

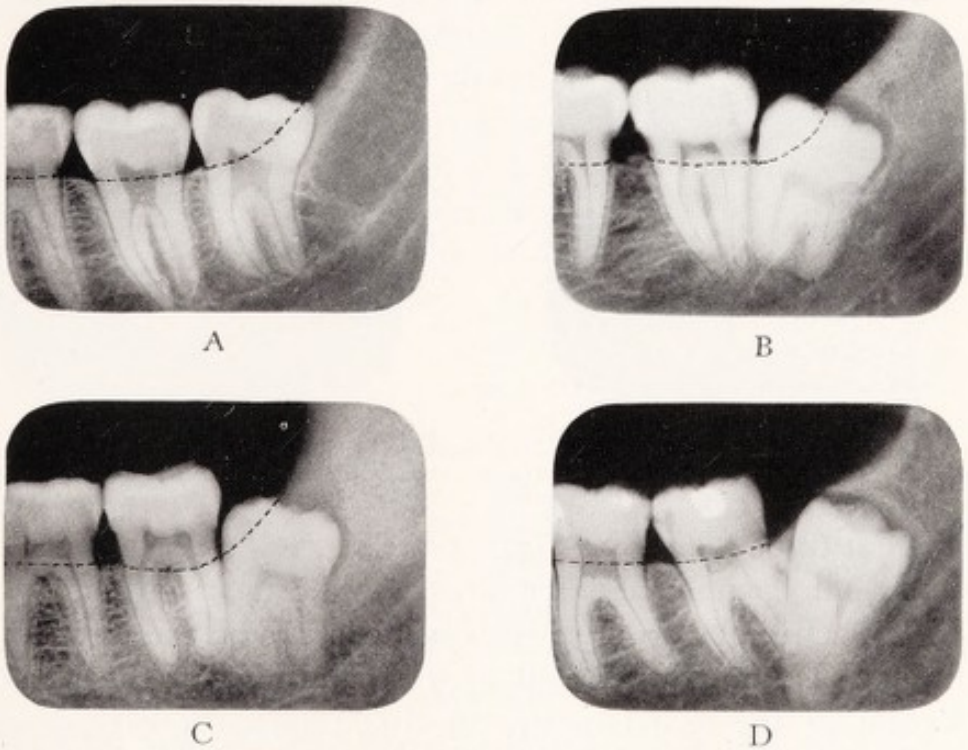


Fig. 155.—Ossistructure on Buccal Surface — Distoangular Impaction. Distoangular type of impacted mandibular third molar, with a dotted line marking superior border of ossistructure on buccal surface.

buccal surface. A study of these four types will give a good idea of the variation in the location of the ossistructure in this type of a case, where the superior border of the ossistructure may extend from the gingival third to the occlusal surface.

In Fig. 155 A the superior border of the ossistructure on the mesial half of the buccal surface extends slightly beyond the gingival third, leaving the buccal surface at this point free of ossistructure, but the distobuccal half is covered by ossistructure. Rarely is the entire buccal surface free of ossistructure in this type of an impaction.

In Fig. 155 B the superior border of the ossistructure extends beyond the gingival third, and not so much of the buccal surface is free of ossistructure as in Fig. 155 A. In Fig. 155 C the superior border of the ossistructure extends farther beyond the gingival third, and less of the buccal surface is free of ossistructure than in Figs. 155 A and 155 B. In Fig. 155 D the superior border of the ossistructure extends beyond the gingival third up to and over the mesial surface, indicating that the ossistructure extends over the entire buccal surface.

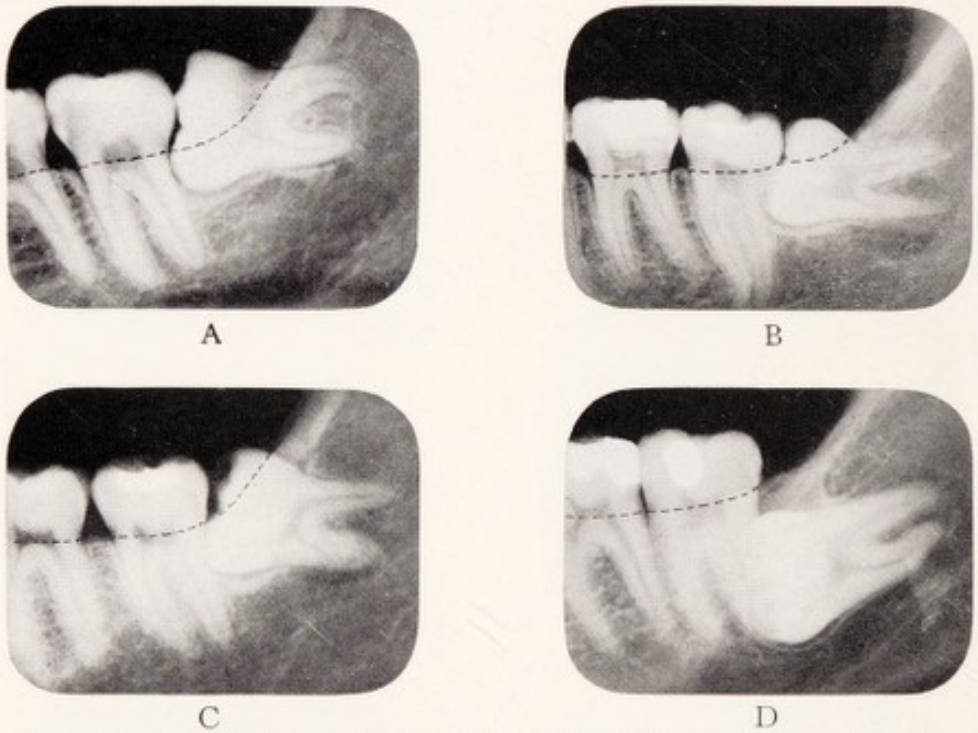


Fig. 156.—Ossistructure on Buccal Surface — Horizontal Impaction. Horizontal type of impacted mandibular third molar, with dotted line marking superior border of ossistructure on buccal surface.

Horizontal Impaction.—In Fig. 156 are shown four types of the mandibular third molar impacted in a horizontal position, with a dotted line marking the superior border of the ossistructure on the buccal surface. A study of these four types will give a good idea of the variation in the location of the ossistructure in this type of a case, where the superior border of the ossistructure may extend from the gingival third to the occlusal surface.

In Fig. 156 A the superior border of the ossistructure extends slightly beyond the gingival third, leaving the greater part of the buccal surface free of ossistructure. In Fig. 156 B the superior border of the ossistructure extends slightly beyond the gingival third, and not so much of the buccal surface is free of ossistructure as in Fig. 156 A. In Fig. 156 C the superior border of the ossistructure extends farther beyond the gingival third, and less of the buccal surface is free of ossistructure than in Figs. 156 A and 156 B. In Fig. 156 D the superior border of the ossistructure extends beyond the gingival third up to the occlusal surface, indicating that the ossistructure extends over the entire buccal surface.

OSSISTRUCTURE ON THE LINGUAL SURFACE OF THE THIRD MOLAR

The ossistructure on the lingual surface, like that on the buccal surface of the impacted mandibular third molar, will not be visible in the radiogram as this part of the ossistructure is obliterated by the denser structure of the tooth. The diagnosis of the case should be made, as in the case where the ossistructure is beyond the gingival third of the buccal surface of the third molar, by determining the location of the superior border of the ossistructure of the first and second molars and the ossistructure on the distal surface of the third molar. The height of the lingual structure can be approximately judged by the location of the buccal structure.

The extent to which the ossistructure extends over the lingual surface of the third molar beyond the gingival third will be found in most instances to be a counterpart of the structure on the buccal surface if the tooth is not lingually or buccally deflected, and the operator may use the buccal structure as a guide for the location of the superior border of the ossistructure on the lingual surface. If the crown is in alignment with the approximating anterior tooth, the ossistructure will be comparatively thin on the lingual surface, but will be heavier the farther the tooth is deflected buccally. In a case of lingual deflection there will be a decrease in the amount of ossistructure on the lingual surface the farther the tooth is deflected lingually, and in a case of complete lingual deflection there will usually be no ossistructure over the occlusal surface. In rare cases, however, there may be a ledge over the occlusal surface, but the excision of the lingual ossistructure is seldom indicated. The case requiring any lingual excision is where there may be a ledge over the occlusal surface in a lingual or complete lingual deflection, and in an occasional case where the tooth is at an angle or in a horizontal position and the mesial surface of the crown is below the superior border of the ossistructure.

OSSISTRUCTURE ON THE DISTAL SURFACE OF THE THIRD MOLAR

The ossistructure on the distal surface of the crown of the impacted mandibular third molar should be carefully studied in the radiogram for the purpose of estimating the amount of this structure that may be present and the probable resistance that it may cause during extraction, and to determine how much of this structure should be excised in order to allow the tooth to be extracted without any material resistance. Where, in such an interpretation, the ossistructure on the distal surface is found to be only up to the gingival third, often no excision will be necessary on that surface. If, however, the structure extends beyond the gingival third in various places up to the occlusal surface, its excision is usually indicated.

An interpretation of the ossistructure from the occlusal surface to the gingival third—whether the tooth is in a vertical, horizontal or an angular position—will usually determine the amount of excision necessary at that point. No operative procedure should be undertaken without first excising, where indicated, the ossistructure on the distal surface. The excision of the ossistructure on the distal surface, instead of the extensive excision of the buccal plate, which was formerly a common procedure, reduces the amount of excision of the ossistructure supporting an impacted tooth. The excision on the distal surface in a vertical and mesioangular impaction allows the initial extraction movement to be made distally in those cases, to be followed, when indicated, by a tractile movement in line with the axis of the tooth, and in some cases of angular, and in all cases of horizontal impactions it is often the direction for the final extraction movement. The distal structure is in most cases more readily excised than the buccal structure, but gaining access with the instrument to the part to be excised is in some vertical cases more difficult, and the existing condition must be carefully examined in advance in order to determine definitely the technic to be executed.

The clinical findings as to the location of the internal and external oblique ridges should be compared with the radiographic interpretation. From the clinical evidence presented by the internal and external oblique ridges a deduction can be made of the variation, if any, in the location of the ossistructure on the distal surface of the impacted tooth. In the majority of cases the internal and external oblique ridges are distal to the mesial half of the crown, and, should they cast a false shadow in the radiogram and lead the operator to conclude that there is more ossistructure on the distal surface than is evident in the clinical findings, the condition will favor the operator, as he will

find less ossistructure over the distal surface than has been shown by the radiogram.

Vertical Impaction.—In Fig. 157 are shown four types of the mandibular third molar impacted in a vertical position, presenting the variation that may be found in the location of the ossistructure on the distal surface.

In Fig. 157 A the ossistructure is at the gingival third, which condition is usually due to a pathologic involvement; in Fig. 157 B it is slightly beyond the gingival third, and in Figs. 157 C and 157 D it extends up to the occlusal surface. In the vertical type the farther the occlusal surface of the third molar is below the corresponding surface of the second, and the farther the ossistructure on the distal surface extends upward beyond the gingival third, the greater will be the difficulty of obtaining access for excision, and careful consideration should be given to this condition in advance of any operative procedure.

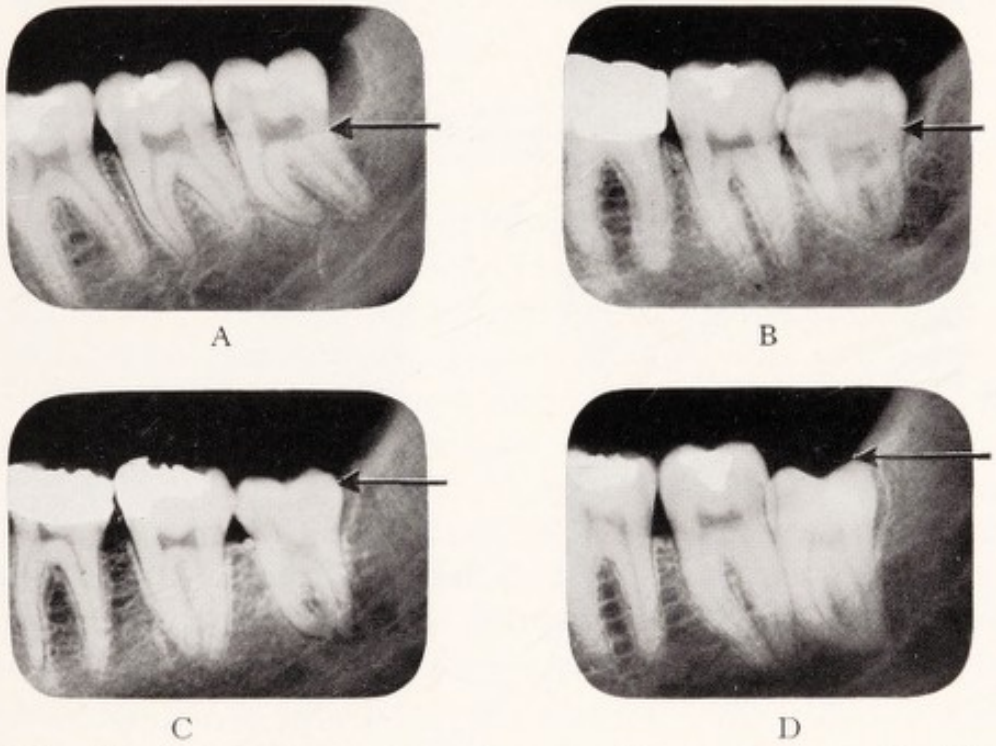


Fig. 157.—Ossistructure on Distal Surface — Vertical Impaction. Vertical type of impacted mandibular third molar, showing some of variations that may be found in ossistructure on distal surface.

Mesioangular Impaction.—In Fig. 158 are shown four types of the mandibular third molar impacted in a mesioangular position, presenting the variation that may be found in the location of the ossistructure on the distal surface. In Fig. 158 A the ossistructure is at the gingival third; in Fig. 158 B it is slightly beyond the gingival third, and in Figs. 158 C and 158 D it is up to the occlusal surface.

Distoangular Impaction.—In Fig. 159 are shown two types of the mandibular third molar impacted in a distoangular position, present-

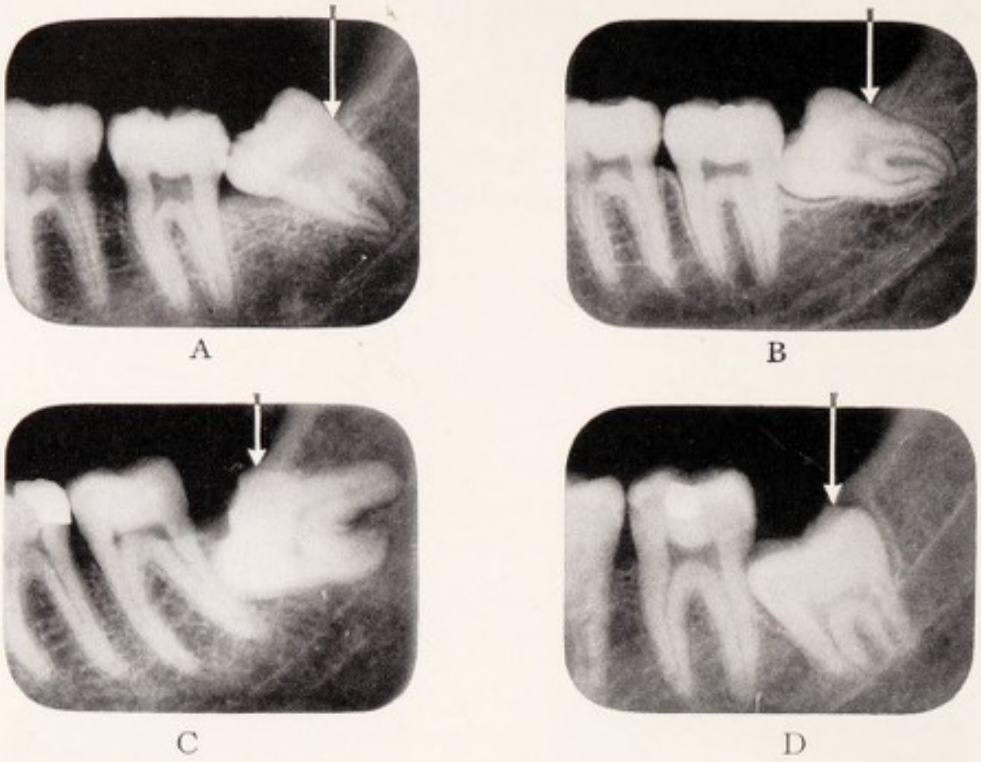


Fig. 158. — Ossistructure on Distal Surface — Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, showing some of variations that may be found in ossistructure on distal surface.

ing the variation that may be found in the location of the ossistructure on the distal surface. In Fig. 159 A the third molar, due to a pathologic condition, is free of ossistructure up to the gingival third, and in this type of a case the distal surface is rarely free of ossistructure down to the gingival third unless the condition is due to a pathologic involvement. In Fig. 159 B the ossistructure extends beyond the gingival third up to the occlusal surface.

Horizontal Impaction.—In Fig. 160 are shown four types of the mandibular third molar impacted in a horizontal position, presenting the variation to be found in the location of the ossistructure on the distal surface. In Fig. 160 A the distal surface is free of ossistructure beyond the gingival third and almost to the apical end; in Fig. 160 B it is free

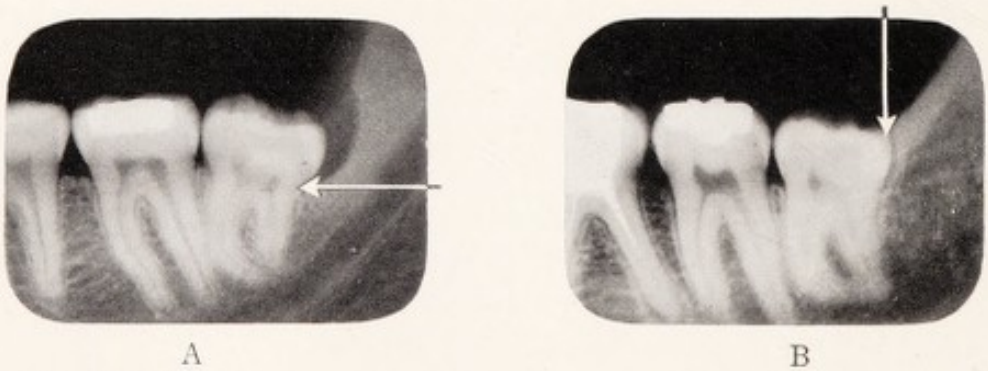


Fig. 159.—Ossistructure on Distal Surface — Distoangular Impaction. Distoangular type of impacted mandibular third molar showing some of varations that may be found in ossistructure on distal surface.

of ossistructure up to the gingival third; in Fig. 160 C it extends beyond the gingival third, and in Fig. 160 D the ossistructure extends beyond the gingival third up to the occlusal surface.

As a rule the widths of the distal surface of the crown and of the distal root of the impacted third molar are respectively smaller than the mesial surface and mesial root of that tooth, and, where this is the case, the condition will be found to be quite an advantage, as it will materially decrease the amount of ossistructure to be excised.

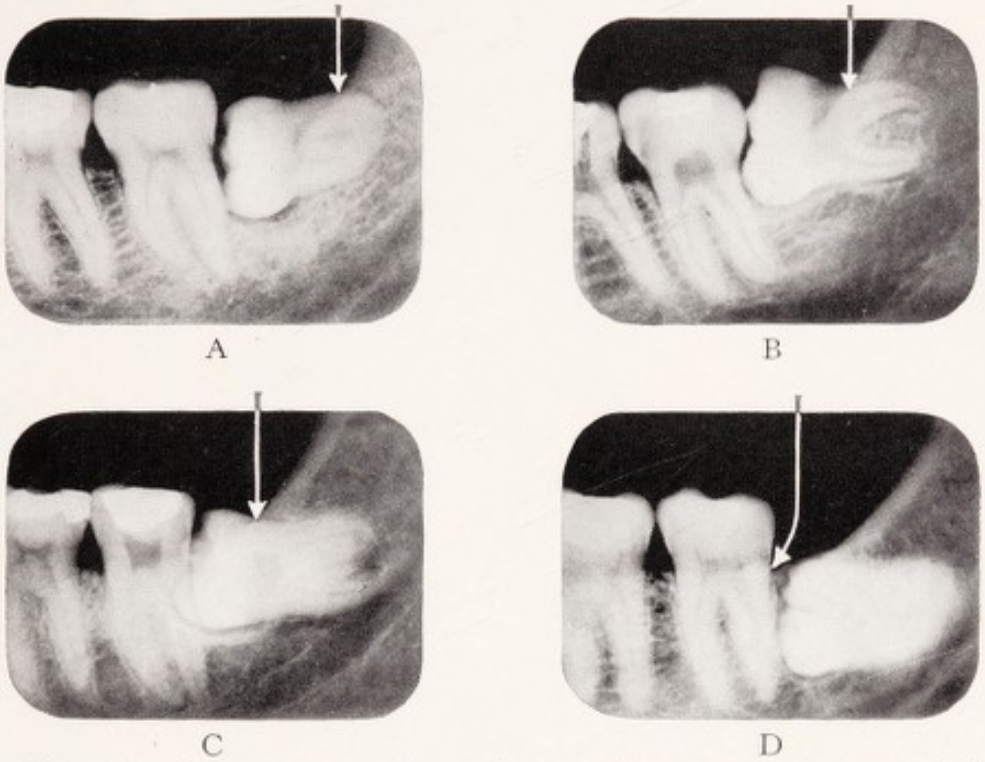


Fig. 160. — Ossistructure on Distal Surface—Horizontal Impaction. Horizontal type of impacted mandibular third molar, showing some of variations that may be found in ossistructure on distal surface.

OSSISTRUCTURE OVER THE DISTOCLUSAL SURFACE OF THE THIRD MOLAR

The radiogram will definitely outline the ossistructure in those cases where it extends over the distoclusal surface. The ossistructure that may be over the occlusal surface is quite a resisting factor, and, even if every other point of resistance is excised and this part is overlooked, it will be sufficient to defeat the operator in his efforts at extraction. This condition is most common in the vertical and angular types of impaction. The importance of obtaining all the details in an intra-oral radiogram is most prominently indicated where the ossistructure is over the distoclusal surface as the details thus secured are usually lost in an extra-oral radiogram.

The ossistructure on the occlusal surface usually extends toward the distal half of this surface, and there are cases where the ossistructure extends over the entire occlusal surface.

Vertical Impaction.—In Fig. 161 is shown an enlarged radiogram of the mandibular third molar impacted in a vertical position, with the ossistructure over the distoclusal surface, and the position of the occlusal surface of the third molar should be compared with the corresponding surface of the second. The distance of the distal surface of the second molar from the ossistructure on the distal surface of the third should be considered for the purpose of gaining access when excising the ossistructure over the distal and distoclusal surfaces, as the distance in this case is greater than will be found in the majority of cases of mesioangular and horizontal types.

Fig. 161. — Ossistructure over Distoclusal Surface—Vertical Impaction. An enlarged radiogram of vertical type of impacted mandibular third molar, showing ossistructure extending over distoclusal surface.

In Fig. 162 are shown two types of the mandibular third molar impacted in a vertical position, with the ossistructure extending over the distoclusal surface, presenting the variation to be found in the amount of ossistructure over the distoclusal surface.

Fig. 162. — Ossistructure over Distoclusal Surface—Vertical Impaction. Vertical type of impacted mandibular third molar, with ossistructure extending over distoclusal surface.

Mesioangular Impaction.—In Fig. 163 is shown an enlarged radiogram of a mandibular third molar impacted in a mesioangular position, with the ossistructure extending over the distoclusal surface. In this case the occlusal surface of the third molar is at the superior border of the ossistructure, with the ossistructure extending over the distoclusal surface, and its mesial surface inaccessible to the application of the exolever.

Fig. 163. — Ossistructure over Distoclusal Surface—Mesioangular Impaction. An enlarged radiogram of mesioangular type of impacted mandibular third molar, showing ossistructure extending over distoclusal surface.

Distoangular Impaction.—In Fig. 164 are shown two types of the mandibular third molar impacted in a distoangular position, with the ossistructure extending over the distoclusal surface. The presence of an interseptum between the second and third molars, with quite an interproximal space, will present a perplexing condition to one not accustomed to interpreting the radiogram when making an

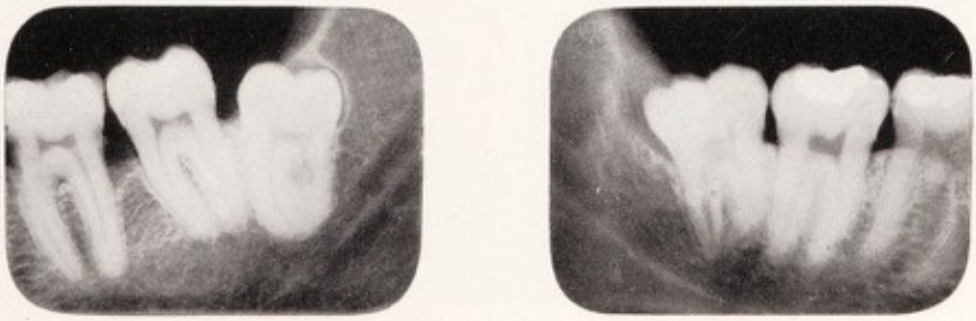


Fig. 164. — Ossistructure over Distoclusal Surface—Distoangular Impaction. Distoangular type of impacted mandibular third molar, showing ossistructure extending over distoclusal surface.

effort to identify the ossistructure over the distoclusal surface, where the structure will become a resisting factor if not excised in advance of the application of the forceps or exolever.

Where the tooth is in a horizontal position, the ossistructure will not extend, as a rule, over the distoclusal surface, and, in case it does extend over this part of the tooth, it usually involves the mesioclusal surface or extends over the entire occlusal surface.

OSSISTRUCTURE OVER THE BUCCAL HALF OF THE OCCLUSAL SURFACE OF THE THIRD MOLAR

In an occasional case of vertical or mesioangular impaction the ossistructure extends over the entire buccal fourth or half of the occlusal surface.

In Fig. 165 is shown an enlarged radiogram of a mesioangular type of impaction where the ossistructure extends over the entire buccal half of the occlusal surface. The superior border of the ossistructure in its relation to the occlusal and distal surfaces should be carefully observed, and notice should be taken of the space between the occlusal surface and the ossistructure over the buccal half of this surface. This condition is usually encountered in a mesioangular type of impaction where there is a buccal deflection.

In Fig. 166 are shown two types of the mandibular third molar impacted in a mesioangular position buccolingually deflected, with

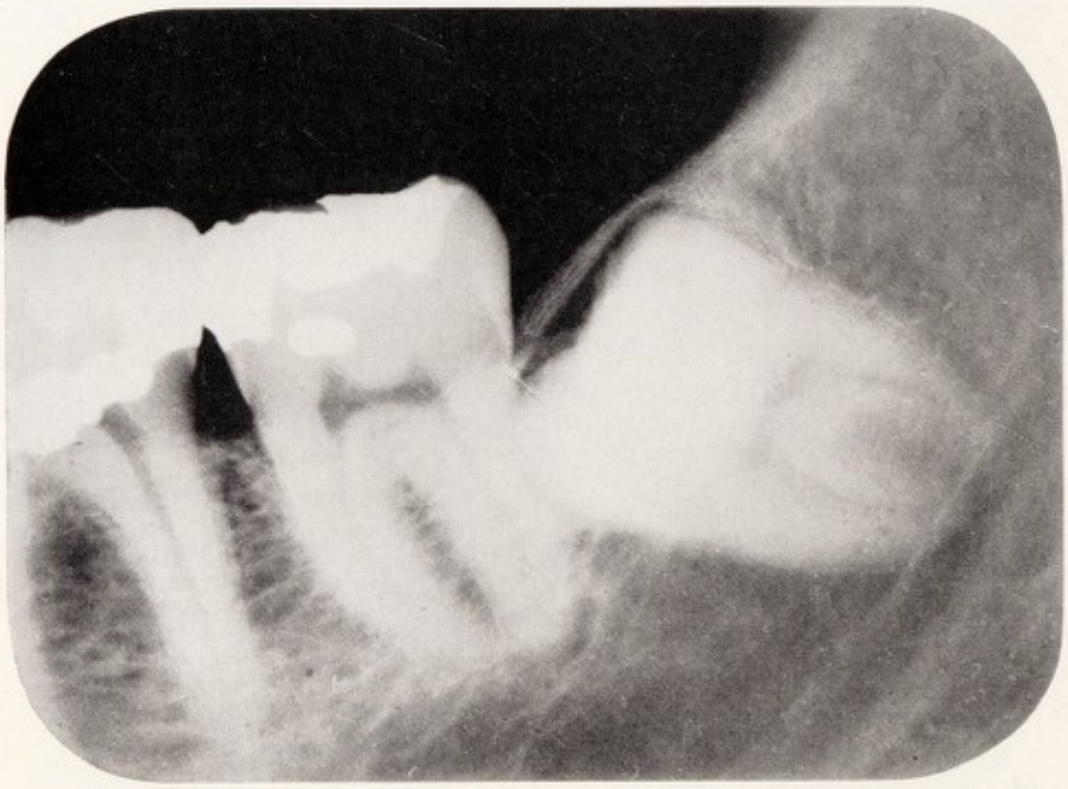


Fig. 165. — Ossistructure over Buccal Half of Occlusal Surface—Mesioangular Impaction. An enlarged radiogram of mesioangular type of impacted mandibular third molar, showing ossistructure extending over buccal half of occlusal surface.

the ossistructure extending over the lingual and buccal half of the occlusal surface, and a space existing between the occlusal surface and the superior border of the ossistructure. In addition to the ossistructure extending over the buccal half of the occlusal surface in this type of impaction the structure also extends over the lingual fourth or half of the occlusal surface.

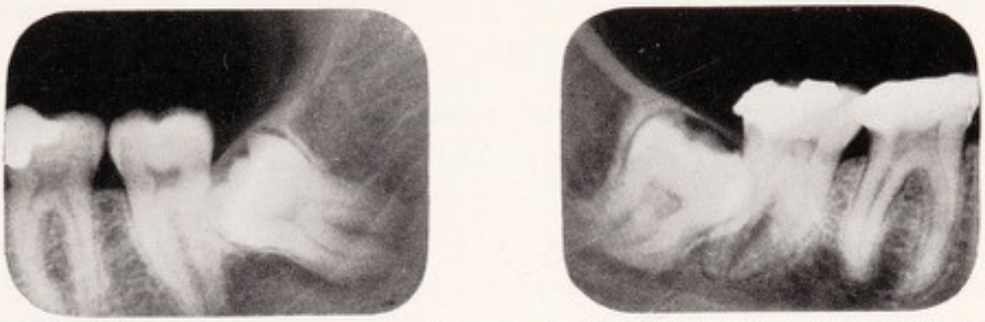


Fig. 166. — Ossistructure over Lingual and Buccal Half of Occlusal Surface—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, showing ossistructure extending over lingual and buccal half of occlusal surface.

OSSISTRUCTURE OVER THE LINGUAL FOURTH OR HALF OF THE OCCLUSAL SURFACE OF THE THIRD MOLAR

Where the third molar is deflected lingually the ossistructure may extend over the lingual fourth or half of the occlusal surface and will be an interfering factor when the exolever technic is executed unless it is excised in advance. As in the case where the ossistructure extends over the buccal half of the occlusal surface there is usually a space between the occlusal surface and the superior border of the ossistructure. Where there is no existing space the structure is usually in the form of a ledge over the lingual fourth or half of the occlusal surface.

In Fig. 167 are shown two cases where the ossistructure extends over the lingual fourth or half of the occlusal surface. This condition is always suspected in a lingual deflection and the appearance of the ossistructure is similar to that which extends over the buccal half of the crown.

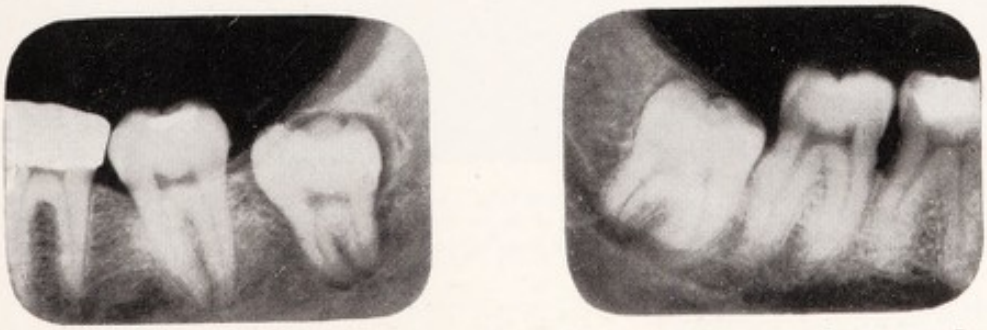


Fig. 167. — Ossistructure over Lingual Half of Occlusal Surface. Impacted mandibular third molar, showing ossistructure extending over lingual half of occlusal surface. It will be noted that there is a space between occlusal surface and superior border of ossistructure.

Where the roots are partially developed ledges are found over the lingual fourth or half of the occlusal surface and must be excised in advance of the application of the exolever. Where the tooth is deflected buccolingually small ledges may be present over the mesiolingual fourth or half of the occlusal surface.

OSSISTRUCTURE OVER THE ENTIRE OCCLUSAL SURFACE OF THE THIRD MOLAR

Cases where the entire occlusal surface is covered by ossistructure are not common in a vertical type, but occur occasionally in a mesioangular type. In a distoangular type the condition is more often presented, and in a horizontal type the condition, on account of the relation of the occlusal surface to the second molar, will not frequently involve the entire occlusal surface.

Vertical Impaction.—In Fig. 168 is shown an enlarged radiogram of a vertical type of impaction where the occlusal surface is below the superior border of the ossistructure and the latter extends over the occlusal surface.

Fig. 168. — Ossistructure over Entire Occlusal Surface—Vertical Impaction. Enlarged radiogram of vertical type of impacted mandibular third molar, showing ossistructure extending over entire occlusal surface.

Mesioangular Impaction.—In Fig. 169 are shown two types of the mandibular third molar impacted in a mesioangular position, with the ossistructure extending over the entire occlusal surface.

Fig. 169. — Ossistructure over Entire Occlusal Surface—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, showing ossistructure extending over entire occlusal surface.

Distoangular Impaction.—In Fig. 170 are shown two types of the mandibular third molar impacted in a distoangular position, with the ossistructure extending over the entire occlusal surface.

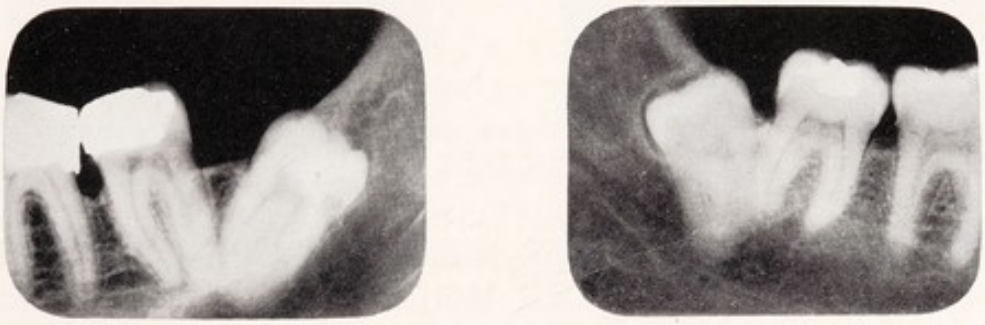


Fig. 170. — Ossistructure over Entire Occlusal Surface—Distoangular Impaction. Distoangular type of impacted mandibular third molar, showing ossistructure extending over entire occlusal surface.

Horizontal Impaction.—In Fig. 171 are shown two types of the mandibular third molar impacted in a horizontal position, and it will be noted that in these cases there is variation in the location of the tooth and the amount of ossistructure over the occlusal surface.

Fig. 171. — Ossistructure over Entire Occlusal Surface—Horizontal Impaction. Horizontal type of impacted mandibular third molar, showing ossistructure extending over entire occlusal surface.

OSSISTRUCTURE OVER THE ENTIRE OCCLUSAL SURFACE OF THE THIRD MOLAR WHERE THE ROOTS ARE PARTIALLY DEVELOPED

Where the roots of the third molar are partially developed, if operative procedure is indicated, the ossistructure extends over the

various surfaces in the same manner as when the tooth is impacted and the roots are fully developed, and the diagnosis is made similar to that described where the roots are fully developed. Space usually exists between the occlusal surface and the superior border of the ossistructure, and the external and internal oblique ridges may be in close proximity to the occlusal surface.

In Fig. 172 are shown two cases where the roots are partially developed and the ossistructure extends over the entire tooth.

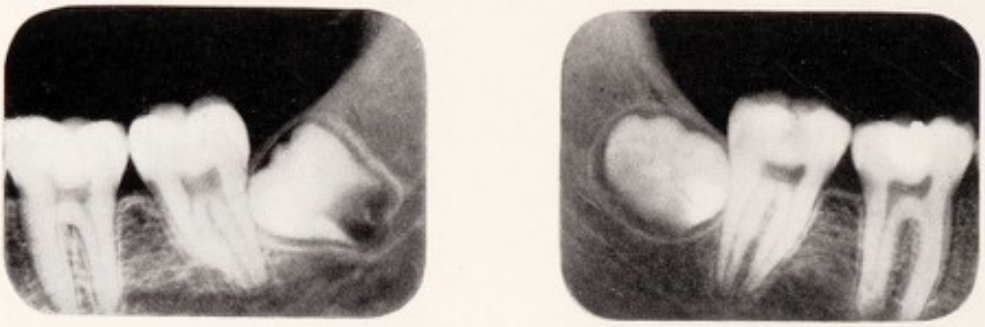


Fig. 172. — Ossistructure over Entire Occlusal Surface—Roots Partially Developed. Impacted mandibular third molar where roots are partially developed and ossistructure extends over entire tooth.

OSSISTRUCTURE ON THE MESIAL SURFACE OF THE THIRD MOLAR

The mesial surface of the impacted mandibular third molar in a vertical type of impaction is usually free of ossistructure from the occlusal surface to the gingival third. Where the occlusal surface of the third molar is quite a distance from the corresponding surface of the second molar, the interseptum between the second and third molars may extend slightly above the gingival third and involve a part of the mesial surface. Where the occlusal surface of the third molar is at the superior border of the ossistructure, which is not of frequent occurrence, the ossistructure may be over the entire mesial surface, and in an occasional isolated impaction the ossistructure may extend over the entire mesial surface. The interpretation of the ossistructure on the mesial surface is described in cases of accessible and inaccessible mesial surfaces in vertical impaction (pages 83, 85), and interseptum between the second and third molars in vertical impaction (page 127). Where the tooth is in an angular or a horizontal position, the ossistructure on the mesial surface is defined in the radiogram as described where the mesial surface is accessible and inaccessible in mesioangular (pages 84, 86), distoangular (pages 84, 86) and horizontal impactions (pages 85, 87); interseptum between the second and third molars in mesioangular (page 128), distoangular (page 129) and horizontal impactions (page 128), and ossistructure on the buccal surface (page 139).

OSSISTRUCTURE MESIAL TO THE CROWN OF THE THIRD MOLAR WHEN BUCCALLY DEFLECTED

The ossistructure anterior to the deflected occlusal and mesial surfaces, when the crown of the third molar is deflected buccally out of alignment with the crown of the second, should be studied in the radiogram with a view of determining the extent of excision that may be necessary to gain access with the exolever to the mesial surface of that part of the crown of the third molar deflected buccally out of alignment with the second. This is done by examining the superior border of the ossistructure, and the distance between the superior border and the mesial surface will determine the amount of ossistructure to be excised in order to gain access with the exolever.

Mesioangular Impaction.—In Fig. 173 are shown two types of the mandibular third molar impacted in a mesioangular position where the buccal surface of the crown is deflected buccally out of alignment with the corresponding surface of the second molar, which condition will permit the excision of the ossistructure anterior to the occlusal or mesial surface that is not in contact with the distal surface of the second molar, and will obviate in most cases the excision of the ossistructure on the buccal surface. The two cases are sufficiently varied in their character to enable the operator to determine the extent to which excision will be necessary along the mesial surface, and in some cases over the occlusal surface, in order to gain access to that part of the mesial surface to which the exolever is to be adjusted.

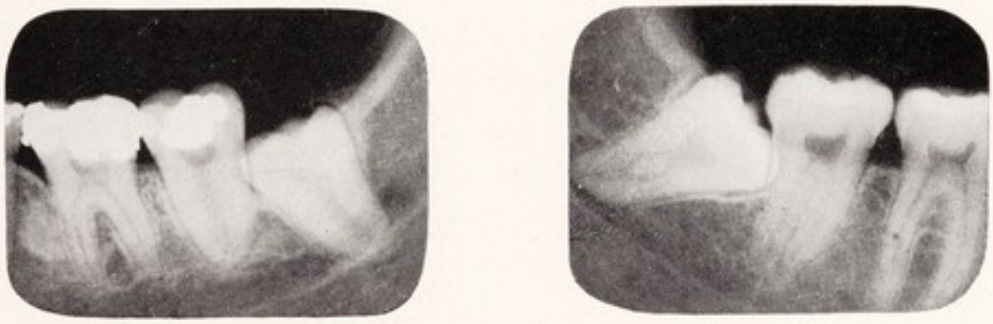


Fig. 173.—Ossistructure Mesial to Occlusal or Mesial Surface when Deflected Buccally—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar where buccal surface of crown of third molar is deflected buccally out of alignment with corresponding surface of second, with ossistructure extending over that part of mesial or occlusal surface out of alignment with distobuccal surface of second molar.

Horizontal Impaction.—In Fig. 174 are shown two types of the mandibular third molar impacted in a horizontal position where the buccal surface of the crown is deflected buccally out of alignment with the distobuccal surface of the second molar, which condition will permit the excision of the ossistructure over that part of the occlusal surface of the third molar that is not in contact with the distal surface of the second, and will obviate the excision of the

ossistructure in most instances on the buccal surface. The two cases are sufficiently varied in their character to enable the operator to determine the extent to which excision will be necessary in order to gain access to that part of the mesial surface of the crown deflected buccally out of alignment with the distobuccal surface of the second molar. The ossistructure from the superior border to the mesial surface of the third molar will indicate the extent of excision necessary over that part of the occlusal surface of the crown deflected buccally out of alignment with the distobuccal surface of the second molar in order to adjust the exolever to the mesial surface.

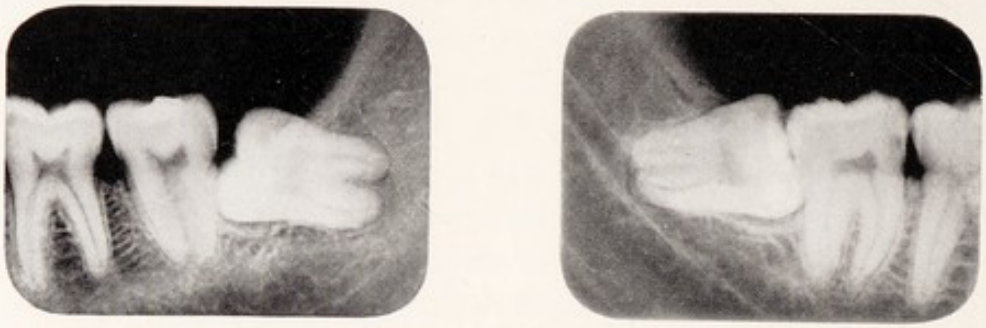


Fig. 174. — Ossistructure Mesial to Occlusal Surface when Deflected Buccally—Horizontal Impaction. Horizontal type of impacted mandibular third molar where buccal surface of crown is deflected buccally out of alignment with distobuccal surface of second molar, with ossistructure extending over that part of occlusal surface that is deflected buccally out of alignment with distobuccal surface of second molar.

OSSISTRUCTURE MESIAL TO THE OCCLUSAL AND MESIAL SURFACES OF THE ISOLATED THIRD MOLAR

Where the third molar is in an isolated position, particular attention should be directed in the radiogram to the ossistructure mesial to the mesial surface in a vertical and distoangular type, mesial to the occlusal and mesial surfaces in a mesioangular and horizontal type, and below the mesial surface in a mesioangular and horizontal type. The surfaces mentioned should be studied for the purpose of determining the method of access with the exolever to the mesial surface. This study is in addition to the diagnostic points described for interpretation in the radiogram of the distal, buccal and lingual surfaces. The exolever in this type of case is adjusted to the mesial surface, utilizing the superior border of the ossistructure and the ossistructure mesial to and below the crown as a fulcrum. When a pathologic condition is present mesial to or below the mesial surface, the size of the area involved is noted to determine whether the area will permit the application of the exolever to the mesial surface without excision, and also to determine, where a large area exists, whether the ossistructure anterior to and below the crown can be utilized as a fulcrum.

The ossistructure, when in a normal condition, makes an ideal fulcrum, but, where it is affected by a pathologic condition the structure cannot be used advantageously, as pathologic involvement has a tendency to disintegrate it, forcing the fulcrum to be at some distance from the crown and thus decreasing the force that could be applied if the condition were normal.

In Fig. 175 are shown two radiograms where the mesial surface of the third molar cannot be reached with the blade of the exolever unless the ossistructure is excised in advance.

Fig. 175. — Ossistructure Mesial to Occlusal Surface—Isolated Impaction. Two radiograms of isolated type of impacted mandibular third molar, with ossistructure extending over occlusal surface.

PATHOLOGIC CONDITION OF THE OSSISTRUCTURE MESIAL TO THE THIRD MOLAR

Where the radiogram indicates a pathologic condition mesial to the crown of the impacted tooth, the condition is usually favorable for the application of the exolever to the mesial surface, as the existing pathologic involvement often obviates the necessity of excising the ossistructure in order to gain access to that surface. This condition is most common in mesioangular and horizontal impactions. In some cases, however, the pathologic involvement may be so extensive as to be a disadvantage, as, for example, in a horizontal type, where it causes the normal ossistructure to be used as a fulcrum to be placed some distance from the tooth.

Fig. 176. — Pathologic Condition Involving Ossistructure on Mesial Surface—Vertical Impaction. Vertical type of impacted mandibular third molar, showing a pathologic condition mesial to mesial surface of tooth, with variation in degree of pathologic involvement that may be found in such cases.

Vertical Impaction.—In Fig. 176 are shown two radiograms of the mandibular third molar impacted in a vertical position, with a pathologic condition anterior to the mesial surface. This condition is occasionally found in this type of impaction, but it is not a common occurrence. The involved area will permit access of the exolever to the mesial surface without excision of the ossistructure on this surface.

Mesioangular Impaction.—In Fig. 177 are shown two radiograms of the mandibular third molar impacted in a mesioangular position, with a pathologic condition anterior to the mesial surface. This is a common condition where the tooth is in this position, and the involved area will permit ready access of the exolever to the mesial surface. When applying the exolever below the mesial surface for the execution of the extraction movement, the weakened condition of the ossistructure will not permit a trial application. The initial application of the exolever should, therefore, be made deliberately, and the blade selected should be inserted at once into the space created by the pathologic condition. When, however, the extraction movement is made to direct the tooth distally, repeated application of the instrument should be avoided, as by each application the ossistructure is weakened and the fulcrum is placed farther away from the mesial surface.

Distoangular Impaction.—A pathologic condition does not, as a rule, involve the ossistructure on the mesial surface in a distoangular impaction, as the condition between the mesial surface of the third molar and the distal surface of the second is similar to that found in a vertical impaction.

Fig. 177. — Pathologic Condition Involving Ossistructure on Mesial Surface—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, showing a pathologic condition mesial to mesial surface of tooth, with variation in degree of pathologic involvement that may be found in such cases.

Horizontal Impaction.—In Fig. 178 are shown two types of the mandibular third molar impacted in a horizontal position, where a pathologic condition involves the ossistructure below the mesial surface, with variation in the degree of pathologic involvement that may be found in such cases. When an exolever is being selected to be inserted into the space between the mesial surface of the third molar and the ossistructure below this surface, the size of the destroyed area

should be considered in determining the size of the exolever blade to be used. A good plan to follow is to have the blade for the initial and final application, respectively, slightly larger than the space, and not to place much dependence on the ossistructure as a fulcrum on account of the decreased resistance of the ossistructure, due to pathologic condition.

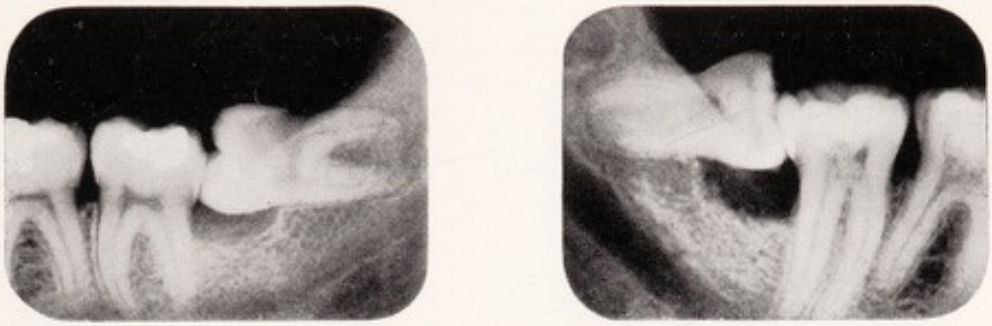


Fig. 178. — Pathologic Condition Involving Ossistructure Below Mesial Surface—Horizontal Impaction. Horizontal type of impacted mandibular third molar, showing a pathologic condition involving ossistructure below mesial surface, with variation in degree of pathologic involvement that may be found in such cases.

PATHOLOGIC CONDITION OF THE OSSISTRUCTURE DISTAL TO THE THIRD MOLAR

It is quite common, where the tooth is in a vertical position and where the gum tissue partially covers the occlusal surface, to suspect that pathologic condition involves only the gum tissue, but a radiogram will usually disclose the presence of pathologic involvement of the ossistructure distal to the crown.

The destruction of the ossistructure varies in different cases from a small to an extensive area. Such pathologic conditions are factors to be considered, after the extraction of the tooth, in connection with the regeneration of the ossistructure. Cases of the character shown demonstrate the importance of extracting the impacted tooth where the radiogram indicates a pathologic condition, and extraction should follow in such cases not only for the purpose of relieving the discomfort usually caused by the impaction, but to correct the pathologic condition.

The destruction of the ossistructure on the distal surface is most common where the tooth is in a vertical position, and occurs occasionally where it is in an angular position, but is rarely found where it is in a horizontal position.

Using the data obtained by the diagnosis of such pathologic conditions as may be distal to the crown of the impacted tooth gives the operator a definite guide as to the amount of ossistructure to excise, as the greater the destruction the less excision will be necessary. In addition, it is quite an advantage to know that the ossistructure is involved, as the excision in such a case is less difficult on account of the weakened condition caused by the pathologic involvement.

Vertical Impaction.—In Fig. 179 are shown two radiograms of the mandibular third molar impacted in a vertical position, with a pathologic condition of the ossistructure on the distal surface. The amount of ossistructure involved varies in the different cases, showing the destruction that may be found on the distal surface in this type of impaction.

Fig. 179. — Pathologic Condition Involving Ossistructure on Distal Surface—Vertical Impaction. Vertical type of impacted mandibular third molar, showing a pathologic condition of ossistructure on distal surface, with variation in degree of pathologic involvement that many be found in such cases.

Mesioangular Impaction.—In Fig. 180 are shown two radiograms of the mandibular third molar impacted in a mesioangular position, with a pathologic condition of the ossistructure on the distal surface. The

Fig. 180. — Pathologic Condition Involving Ossistructure on Distal Surface—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, showing a pathologic condition of ossistructure on distal surface, with variation in degree of pathologic involvement that may be found in such cases.

amount of ossistructure involved varies in the different cases, showing the destruction that may be found on the distal surface in this type of impaction.

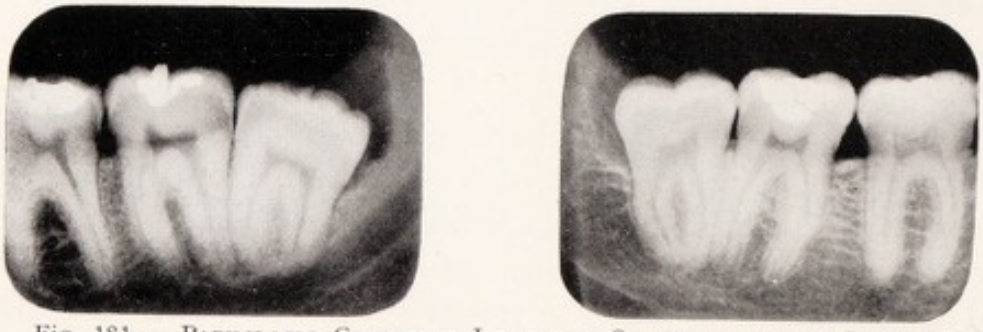


Fig. 181. — Pathologic Condition Involving Ossistructure on Distal Surface—Distoangular Impaction. Distoangular type of impacted mandibular third molar, showing a pathologic condition of ossistructure on distal surface, with variation in degree of pathologic involvement that may be found in such cases.

Distoangular Impaction.—In Fig. 181 are shown two radiograms of the mandibular third molar impacted in a distoangular position, with a pathologic involvement of the ossistructure on the distal surface. The amount of ossistructure involved varies in the different cases, showing the destruction that may be found on the distal surface in this type of impaction.

Horizontal Impaction.—In Fig. 182 is shown an enlarged radiogram of the mandibular third molar impacted in a horizontal position, with a pathologic condition of the ossistructure on the distal surface, extending over the occlusal surface and involving the distal surface of the distal root of the second molar. This is a very unusual condition where the tooth is in a horizontal position, and is advantageous for the excision of the ossistructure on the distal surface.

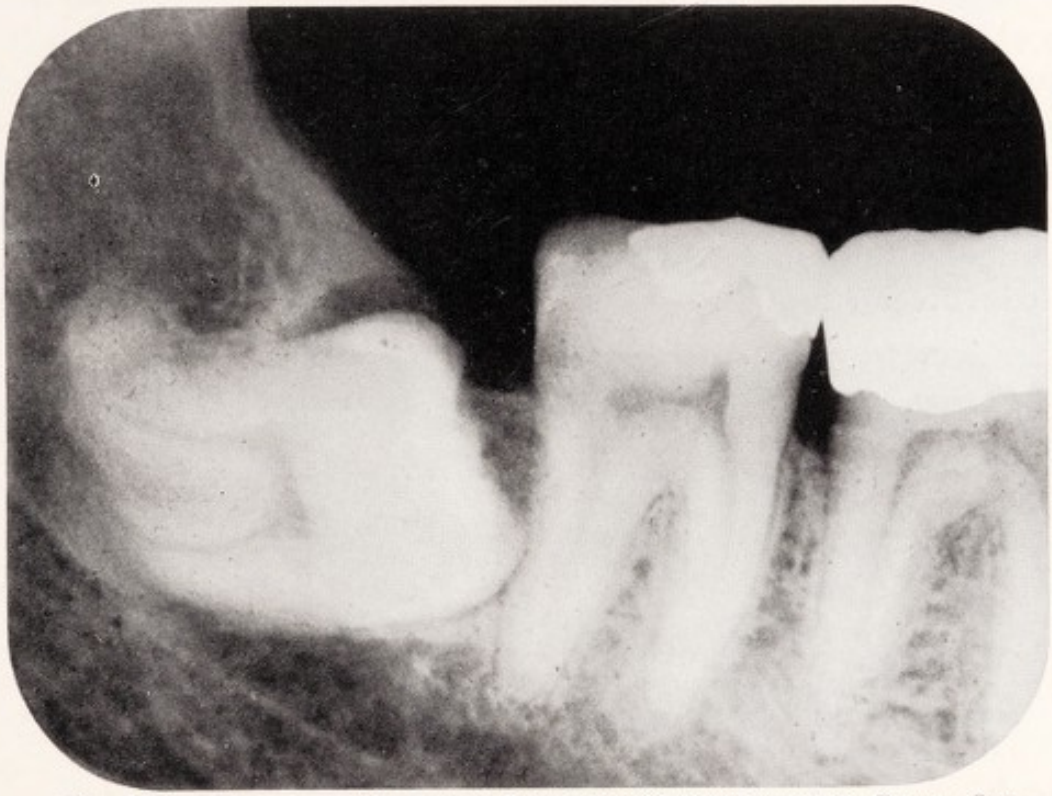


Fig. 182. — Pathologic Condition Involving Ossistructure on Distal Surface—Horizontal Impaction. An enlarged radiogram of horizontal type of impacted mandibular third molar, showing a pathologic condition of ossistructure on distal surface, extending over occlusal surface and involving distal surface of distal root of second molar.

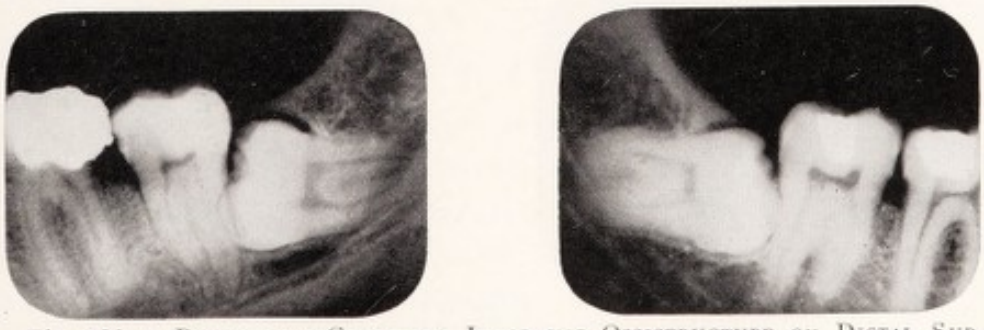


Fig. 183. — Pathologic Condition Involving Ossistructure on Distal Surface—Horizontal Impaction. Horizontal type of impacted mandibular third molar, showing pathologic condition of ossistructure on distal surface.

In Fig. 183 are shown two radiograms of the mandibular third molar impacted in a horizontal position, with a pathologic condition of the ossistructure on the distal surface, but is not so extensive as in a vertical or an angular impaction.

PATHOLOGIC CONDITION OF THE OSSISTRUCTURE MESIAL AND DISTAL TO THE THIRD MOLAR

Occasionally a pathologic condition involves the ossistructure mesial and distal to the crown of the impacted mandibular third molar. In the majority of such cases it will not be necessary to excise the ossistructure on the distal surface in order to facilitate the extraction of the tooth, and the condition of the ossistructure on the mesial surface will be such that the exolever may be applied to this surface without any excision. In this class of cases is shown a condition which should impress the operator with the importance of making a correct radiogram and properly interpreting it, as the operative procedure is simplified in the majority of such cases by the prevailing condition.

Vertical Impaction.—In Fig. 184 are shown two radiograms of the mandibular third molar impacted in a vertical position, with a pathologic involvement of the ossistructure on the mesial and distal surfaces.

Fig. 184. — Pathologic Condition Involving Ossistructure on Mesial and Distal Surfaces—Vertical Impaction. Vertical type of impacted mandibular third molar, showing a pathologic condition of ossistructure on mesial and distal surfaces.

Mesioangular Impaction.—In Fig. 185 are shown two radiograms of the mandibular third molar impacted in a mesioangular position,

Fig. 185. — Pathologic Condition Involving Ossistructure on Mesial and Distal Surfaces—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, showing a pathologic condition of ossistructure on mesial and distal surfaces.

with a pathologic involvement of the ossistructure on the mesial and distal surfaces.

Distoangular Impaction.—A pathologic condition of the ossistructure on the mesial and distal surfaces is not common in this type of impaction.

In Fig. 186 are shown two cases of a lingual deflection of the crown of the third molar, and a contact of the roots of that tooth with the roots of the second molar, with a pathologic condition of the ossistructure on the mesial and distal surfaces.

Fig. 186. — Pathologic Condition Involving Ossistructure on Mesial and Distal Surfaces—Distoangular Impaction. Distoangular type of impacted mandibular third molar, showing a pathologic condition of ossistructure on mesial and distal surfaces.

Horizontal Impaction.—In Fig. 187 are shown two radiograms of the mandibular third molar impacted in a horizontal position, with a pathologic condition of the ossistructure on the mesial and distal surfaces.

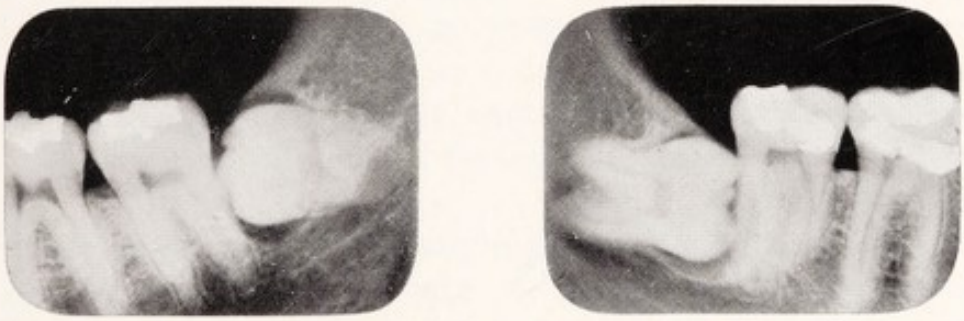


Fig. 187. — Pathologic Condition Involving Ossistructure on Mesial and Distal Surfaces—Horizontal Impaction. Horizontal type of impacted mandibular third molar, showing a pathologic condition of ossistructure on mesial and distal surfaces.

PATHOLOGIC CONDITION OF THE OSSISTRUCTURE BUCCAL TO THE THIRD MOLAR

It is not usual to find a pathologic condition involving the ossistructure on the buccal surface in vertical, angular or horizontal types of impaction. When pathologic involvement is present, it is usually found in a vertical and mesioangular impaction, and, while the condition may be advantageous in some cases, it is, as a rule, disadvantageous, as the structure buccal to the crown will be disintegrated

to such an extent that the most desirable fulcrum for the final extraction movements will be quite a distance from the bifurcation of the roots. The pathologic condition should be recognized in the radiogram in advance, and is usually discernible in that vertical type where there is some pathologic involvement mesial and distal to the crown. By following the superior border of the ossistructure in such a case distally from the first and second molars to the distal surface of the third molar, an outline of the condition can be obtained if the radiogram has been properly made.

In an occlusal radiogram some detail of the pathologic involvement of the ossistructure buccal to the crown of the third molar can be diagnosed, but the radiogram will not show sufficient detail to determine whether it will be possible to utilize the ossistructure as a fulcrum for the exolever.

It is extremely rare to find a case of pathologic involvement of the ossistructure buccal to the crown of the third molar extending very far beyond the bifurcation. When, however, such a case is presented, the condition will deprive the operator of as good a fulcrum as an aid in extracting the tooth as when the conditions are normal, and in such an exceptional case it may be necessary to excise farther for a fulcrum.

In Figs. 184, 185, 186 and 187, where a pathologic condition is shown to involve the ossistructure on the mesial and distal surfaces of the third molar, it will be observed that, by following the superior border of the ossistructure, the structure on the buccal surface is also involved. It is especially important to determine this diagnosis in a vertical or mesioangular impaction, where an adjustment of the exolever will be indicated on the buccal surface for the final extraction movements.

In Fig. 188 are shown two radiograms of the mandibular third molar impacted in a horizontal position where a pathologic condition extends over the occlusal surface and involves the mesial, distal, lingual and buccal surfaces.

Fig. 188. — Pathologic Condition Involving Ossistructure on Occlusal, Mesial, Distal, Lingual and Buccal Surfaces—Horizontal Impaction. Horizontal type of impacted mandibular third molar, showing a pathologic condition of ossistructure involving occlusal, mesial, distal, lingual and buccal surfaces.

PATHOLOGIC CONDITION INVOLVING THE OSSISTRUCTURE SURROUNDING THE THIRD MOLAR

The destruction of the ossistructure, and not the death of the pulp, is occasionally the causative factor of a pathologic condition involving the ossistructure supporting the roots of the impacted tooth. It is not unusual to find that the ossistructure distal to the crown of the impacted molar is affected to such an extent that not only the entire distal root is involved, but also the mesial root. Clearly defined instances of such character are presented in Fig. 189, where are shown two cases of a pathologic condition extending entirely around the tooth.

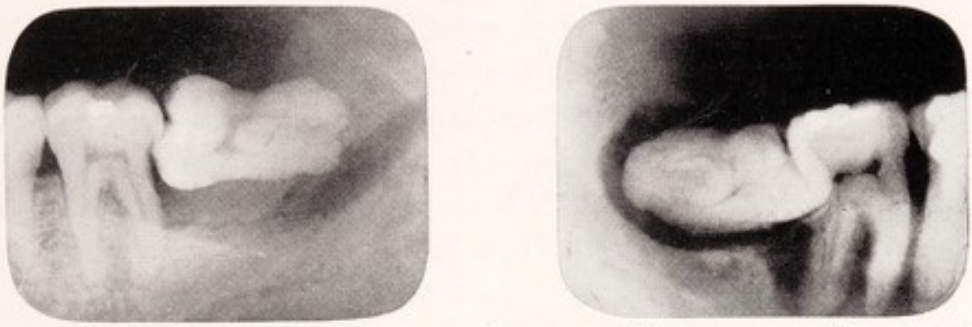


Fig. 189.— Pathologic Condition Involving Ossistructure Surrounding Impacted Tooth—Horizontal Impaction. Horizontal type of impacted mandibular third molar, showing tooth entirely surrounded by a pathologic condition.

PATHOLOGIC CONDITION OF THE APICAL THIRD OF THE ROOTS OF THE THIRD MOLAR

Where the crown of the third molar is not affected by caries, there is usually no evidence of a pathologic condition of the apical third of the roots. In Fig. 190 are shown various types of the impacted mandibular third molar where the crown is involved by caries, with a pathologic involvement at the apices, presenting two diagnostic points that have an important bearing on the operative procedure: (1) the crown is involved by caries, and (2) a pathologic condition is present at the apices. The affected ossistructure and peridental membrane, which latter is always involved in a case of this character, will materially reduce any resistance when extracting the tooth, and is a very important diagnostic point.

Fig. 190.— Pathologic Condition of Apical Third of Roots of Third Molar. Horizontal type of impacted mandibular third molar, showing crown involved by caries, with pathologic condition involving apical third.

THIRD MOLAR IN PROXIMITY TO THE LOWER BORDER OF THE MANDIBLE

The lower border of the mandible should be clinically examined, especially in a practically edentulous mouth where there is only an isolated impacted mandibular third molar, and these clinical findings should be carefully studied in conjunction with the radiographic interpretation. Occasionally, where the mandible is of a very small type, the apical ends of the roots of a mandibular third molar may extend as far as the lower border of the mandible, and in the extraction of such a tooth great care must be exercised to avoid a fracture of the mandible. Where the radiogram shows that there is insufficient ossistructure to be used as a fulcrum to support the exolever, the pressure that may be applied in such a case should be governed by the character of the ossistructure surrounding the tooth. In some cases, however, the radiogram will show a deficiency of the supporting ossistructure, with the root ends of the tooth extending to the lower border of the mandible.

In Fig. 191 are shown two cases of the impacted mandibular third molar in the position described, with the apical ends in close proximity to the lower border of the mandible.

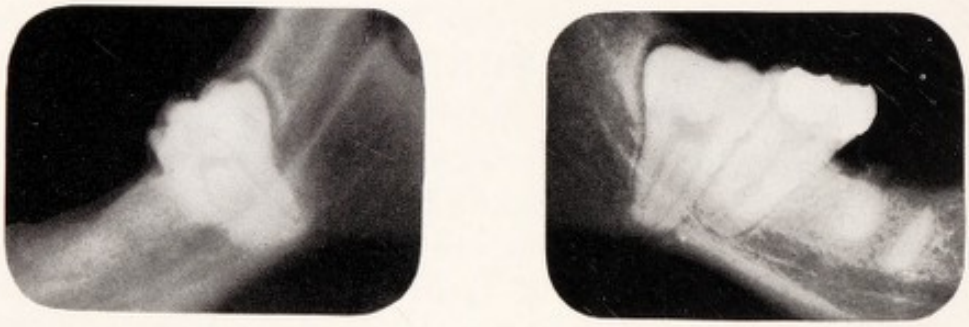


Fig. 191. — Lower Border of Mandible. Vertical type of impacted mandibular third molar, with apical ends in close proximity to lower border of mandible.

In Fig. 192 are shown two cases of the impacted mandibular third molar in a practically edentulous mouth where the mandible is very small.

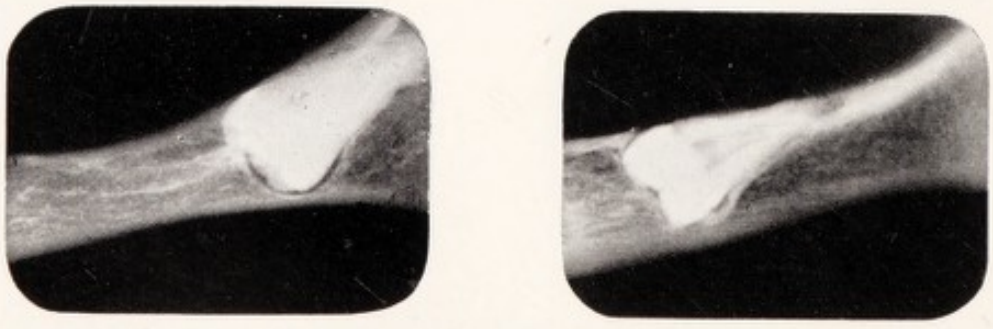


Fig. 192. — Lower Border of Mandible. Practically edentulous mouth where mandible is very small and third molar is impacted.

EXTERNAL AND INTERNAL OBLIQUE RIDGES

Where the mandibular third molar is impacted and there is no lingual or buccal deflection the external oblique ridge is usually some distance buccal to the distobuccal surface of the third molar; where there is a buccal deflection it may extend up to the distobuccal surface or over the buccal fourth or half of the occlusal surface; where the crown is lingually deflected the ridge is usually some distance away from the distobuccal surface, and may extend to the distobuccal surface or to the center of the distal surface; where there is a buccolingual deflection the ridge is varied in its location and may extend to the distobuccal surface; and in some cases it extends over the entire buccal surface or over the buccal fourth or half of the occlusal surface.

Where the mandibular third molar is impacted and there is no lingual or buccal deflection, the internal oblique ridge is usually lingual to the distolingual surface of the third molar; it may extend to the distolingual surface, and in some cases it extends to the center of the distal surface. Where there is a buccal deflection it may not extend to the distolingual surface; where there is a lingual deflection the ridge may extend up to the distolingual surface, to the center of the distal surface or over the lingual fourth of the occlusal surface. In a buccolingual deflection the location of the ridge is varied and often extends to the center of the distal surface of the third molar; in a complete lingual deflection the ridge extends over the greater part of the distal surface.

CHAPTER VIII

Radiographic Interpretation of the Crown of the Second Molar

WHERE an interpretation has been made from the radiogram of an impacted mandibular third molar, including the crown, roots and supporting ossistructure, an interpretation from the same radiogram should be made also of the second molar. As the second molar is an important factor to be considered in connection with the extraction of the third molar, its retention in the arch, when in a normal condition, is of value to the patient, and every effort should be made to retain it. As the third molar should be extracted without causing the loss of the second molar, where the latter tooth is normal, a technic should be executed that will not injure the second molar during the extraction of the impacted third molar. It will, therefore, be necessary that the second molar be given proper consideration before the operative procedure, and a careful study should be made of its crown, roots and supporting ossistructure.

In some cases of the impacted third molar the second molar will be in a condition that requires the operator to decide whether the latter tooth should be retained. Where the crown, roots or ossistructure supporting the second molar are so involved by caries or pathologic changes as to indicate that the retention of the tooth will be a menace to the patient, the radiogram, together with the clinical findings, should govern the procedure that is considered to be for the best interest of the patient. The circumstances that affect the retention or extraction of the second molar are of sufficient importance to justify a description of the conditions usually associated with the second molar in connection with the extraction of the third.

CROWN OF THE SECOND MOLAR

The crown of the second molar should be studied as to its position, size, shape and relation to the impacted mandibular third molar. Any deflection of the crown should be noted clinically and checked with the radiogram. If caries involves the crown, the extent of the affection should be determined, and, if the tooth contains a filling or is crowned, the character of the work should be observed. An estimate should be made from the radiogram of the support that the second molar receives from the first molar if the latter tooth is present, and to what extent the second molar may be used as a fulcrum if the condition requires the use of the tooth for that purpose.

The pressure of the occlusal or mesial surface of the third molar upon the distal or distobuccal surface of the second often has the effect of deflecting lingually or buccally the crown of the latter tooth, and the position of the tooth when so deflected should be compared with the position of the impacted third molar.

Crown in Approximately Normal Condition.—Where the radiogram shows that the crown of the second molar is not involved by caries; that it has no large filling and no artificial crown; that it is not deflected and the first molar is present; that the roots are not fused but are bifurcated, and that the supporting ossistructure is normal, the tooth may, where the prevailing conditions indicate its stability, serve as

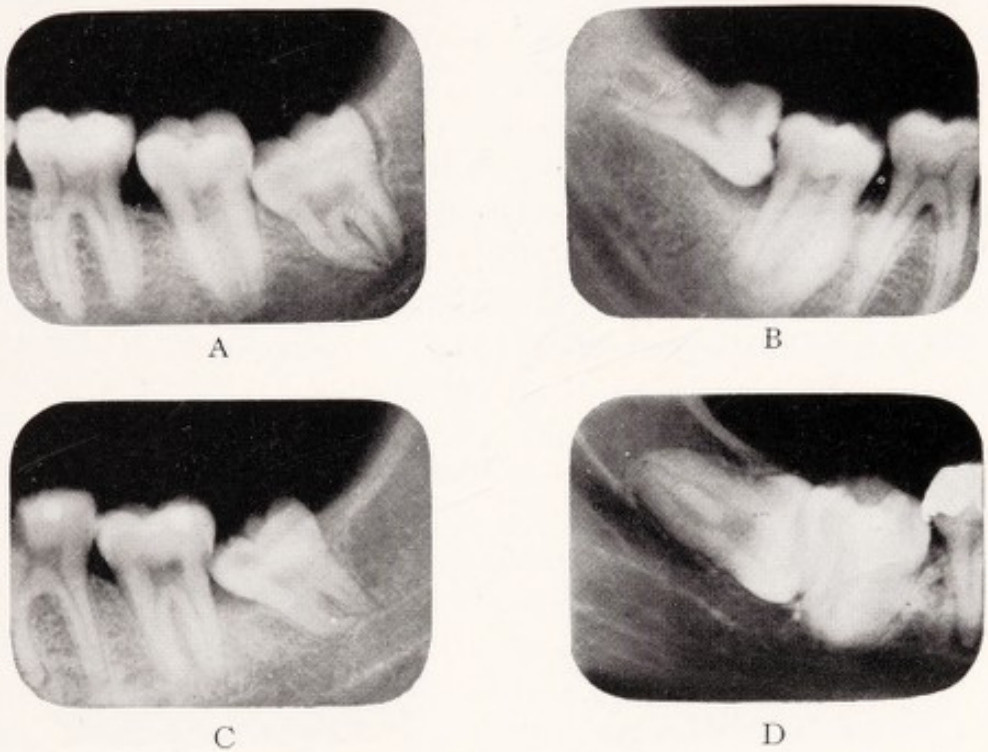


Fig. 193. — Crown Alignment of Second Molar. Variation in alignment of second molar compared with alignment of first.

a fulcrum for the exolever. Where, however, the conditions surrounding the tooth deviate from an approximately normal state, the nature of the deviation should be noted in the radiogram and the operative procedure be modified accordingly.

Alignment of Crown.—The radiographic interpretation of the alignment of the crown should be checked with the clinical findings. Where the tooth is in alignment with the first molar, the enamel cap, pulp chamber, pulp canal and roots will be well defined, but no part of the occlusal surface will be visible. The contact point between the first and second molars should not show an overlap. Occasionally the tooth may be out of alignment as in the case of an impacted mandibular third molar, and the diagnostic points will be the same as described

for determining the alignment of the crown of the mandibular third molar when impacted (page 52).

In Fig. 193 are shown four radiograms where the second molar is out of alignment with the first. In Fig. 193 A there is a slight lingual deflection of the crown of the second molar compared with the crown of the first. In Figs. 193 B and 193 C the alignment of the occlusal surface of the second molar is below the corresponding surface of the first. In Fig. 193 D there is a decided lingual deflection of the crown of the second molar compared with the first.

Caries Involving Crown.—The most common affection involving the crown of the second molar is caries, and the location and size of the resulting cavity should be carefully examined for the purpose of determining whether restoration of the parts involved should be advised, or whether, in case the cavity is very large and the condition is considered to be beyond restoration, resort should be had to extraction.

In Fig. 194 are shown two cases where, if the condition of the second molar is not closely observed, the involvement of that tooth by caries might not be noticed, as the radiogram does not show a break in the continuity of the enamel cap, and the cavity is often started with a small pit in the occlusal or distal surface.

Fig. 194.—Caries Involving Crown of Second Molar. Caries involving crown of second molar, and third molar impacted.

Caries Involving Occlusal Surface.—In Fig. 195 are shown two cases where caries has involved the occlusal surface of the second molar, and there is a variation in the location and size of the cavity. The operator should determine from the radiogram whether it is advisable to retain the tooth, being governed by the size of the cavity, the strength of the remaining walls, the character of the ossistructure, the condition of the apical third of the roots and any involvement of the pulp chamber that may be present. If the operator concludes to retain the second molar, he should make an estimate of the strength of the distal surface of the crown to withstand any pressure that may result from the application of the exolever, when indicated, for the purpose of using the tooth as a fulcrum. If, however, the

distal surface does not appear to be strong enough for the support of the exolever as a fulcrum, it will be necessary to operate independently of the second molar and not further involve its crown by causing a fracture during the extraction of the third molar.

Fig. 195. — Caries Involving Occlusal Surface of Second Molar. Caries involving occlusal surface of second molar, with a variation in location and size of cavity; third molar impacted.

Caries Involving Distal Surface of Crown.—There is a decided advantage in making a radiogram of both the second and the impacted third molar, as it will enable the operator to determine whether the third molar has caused the distal surface of the second to be affected with caries, or whether the pressure of the third molar has contributed to causing a cavity on that surface.

Previous to the use of the radiogram in connection with the extraction of the mandibular third molar, a cavity was frequently found in the second sometime after the extraction that was not suspected, at the time of the operation, to be present. In such a case the patient would suffer for a time and return to the operator for relief. The operator, not suspecting any involvement of the second molar, would conclude that the disturbance was in the socket of the extracted tooth, and would adopt the procedure usually followed in such a case. It would, therefore, be quite embarrassing for the operator at a later date to find it necessary to extract the second molar, as he had operated on the third molar with the idea of retaining the former tooth. With the aid of the radiogram the operator can determine whether it is advisable to retain the second molar, and can in that case execute

Fig. 196. — Caries Involving Distal Surface of Second Molar. Caries involving distal surface of second molar, with a variation in location and size of cavity; third molar impacted.

the operative procedure in conformity with the prevailing conditions.

In Fig. 196 are shown two cases where the second molar is affected by caries on the distal surface, with the third molar impacted. An examination of these cases will show variation in the location and size of the cavity. As the cavity does not, however, involve the pulp chamber or distal root, there is indication that the cavity can be properly filled and the tooth made serviceable to the patient.

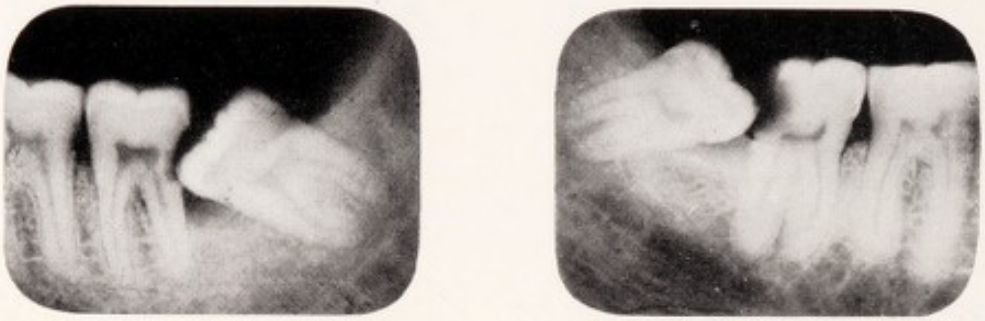


Fig. 197. — Caries Involving Distal Surface of Second Molar. Caries involving distal surface of second molar at gingival third, with a larger area affected than in cases shown in Fig. 196.

In Fig. 197 are shown two cases where the second molar is affected by caries on the distal surface, with the third molar impacted. The cavity in these two cases is at or below the gingival third, the size of the affected area is larger than in the cases described in Fig. 196, and in addition to the cavity there is a pathologic area below the mesial surface of the third molar. When considering the procedure

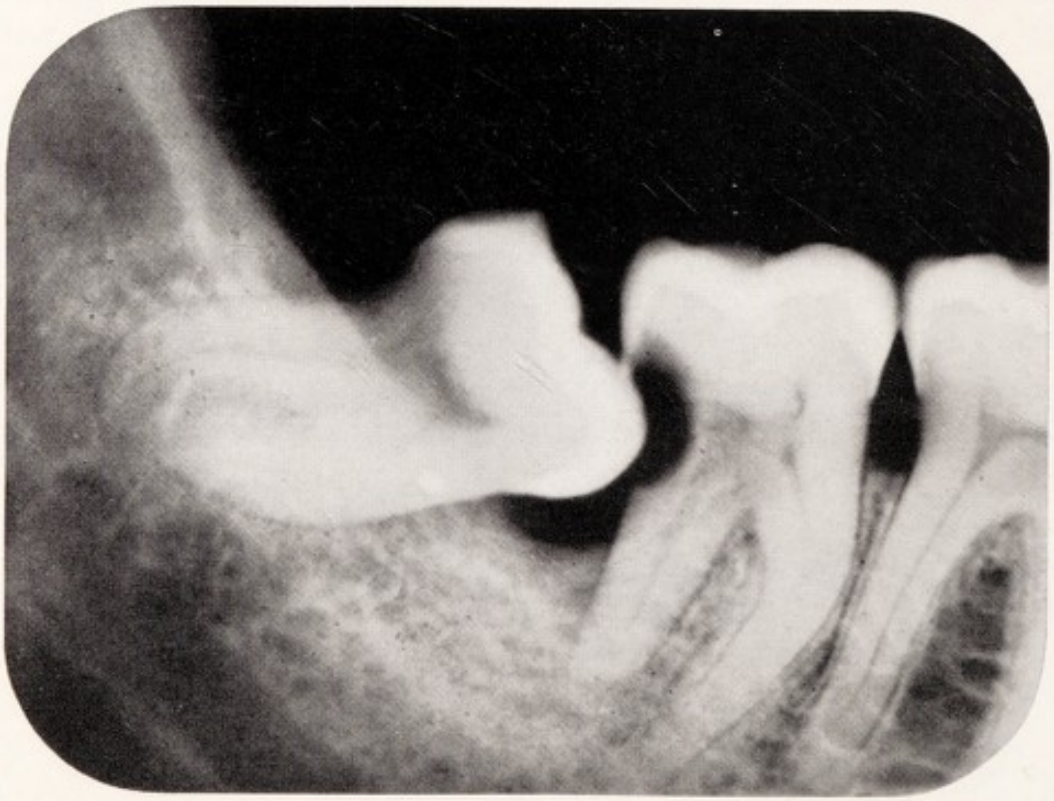


Fig. 198. — Caries Involving Distal Surface of Second Molar. An enlarged radiogram where there is a large cavity in distal surface of second molar, involving gingival third of tooth, and pathologic involvement affects part of distal root.

to follow, the pathologic area and the size of the cavity should be determined by the operator in advance of any operation on the impacted tooth.

In Fig. 198 is shown an enlarged radiogram of a case where there is a large cavity involving the gingival third of the distal surface of the second molar.

In Fig. 199 are shown four radiograms of two cases where caries and a pathologic condition involve the distal surface of the crown and the distal root of the second molar. In Figs. 199 A and 199 C are shown the condition before the extraction of the impacted third molar, and in Figs. 199 B and 199 D are shown the condition after the extraction, presenting the condition of the involved distal surface.

Filling in Second Molar.—Where, in the case of an impacted mandibular third molar, there is an amalgam or gold filling, or gold inlay, in the second molar, a radiogram will show the location and size of the filling. In some cases of this character, if caries exist or filling overhangs at the gingival margin, or if the enamel is unsupported by dentine, there is a liability of displacing the filling in the second molar during the extraction of the impacted tooth. Where such a condition is presented, the patient should be advised of the possibility of the filling being displaced, so that if that event occurs, the operator will not be subjected to unjust criticism.

In Fig. 200 are shown four radiograms of different types of impaction of the third molar, with a filling in the crown of the second

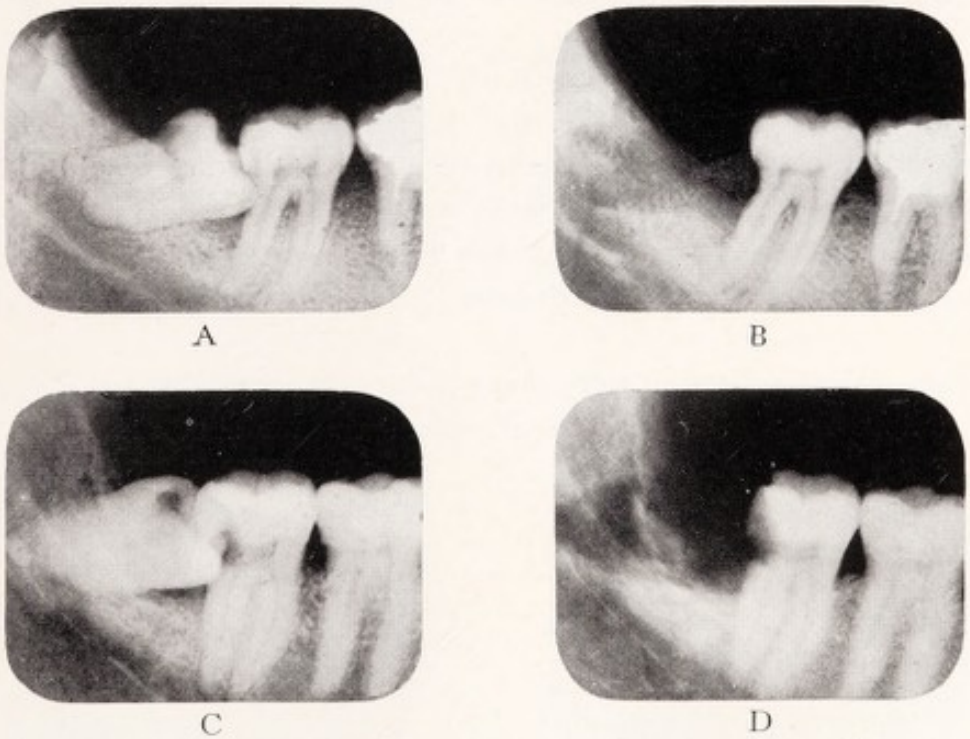


Fig. 199. — Caries and Pathologic Condition Involving Distal Surface of Crown and Distal Root of Second Molar. Caries and a pathologic condition involve distal surface of second molar. *A* and *C*, condition before extraction of third molar; *B* and *D*, condition after extraction.

molar and with variation in the location and size of the filling. A study of these four cases presents an opportunity to differentiate between the various conditions and to analyze the operative procedure to be followed in each case. No dependence can be placed on the second molar as a fulcrum where this tooth has a large filling, and especially is this the case where the filling occupies the distal half of the tooth. It will therefore be necessary, where such conditions prevail, to operate independently of the second molar and avoid endangering this tooth.

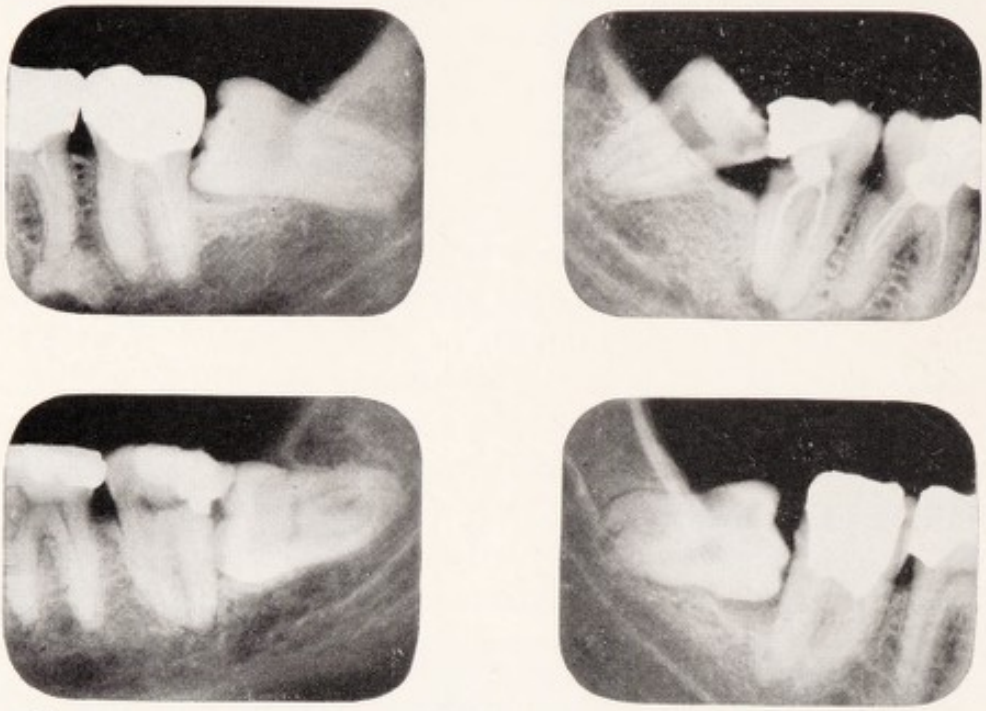


Fig. 200. — Filling in Second Molar. Filling in crown of second molar, with variation in location and size of filling, and third molar impacted.

Second Molar Crowned.—Where the second molar has a gold crown attached that extends to or below the gingival margin, and it does not fit perfectly on the distal surface, the crown may be disturbed during the extraction of the third molar, and in such a case the operator should inform the patient of this liability and advise its removal.

In Fig. 201 are shown two cases of an impacted mandibular third molar where a gold crown is attached to the second. There is a

Fig. 201. — Second Molar Crowned. A gold crown attached to second molar, and third molar impacted.

variation in the relative position of the impacted tooth and the second molar with the gold crown, and the interpretation as to the proper operative procedure in each case can be readily determined. Should the operator conclude not to have the crown remain attached to the second molar, it will be advisable to remove the crown in advance of any operative procedure on the third.

In Fig. 202 are shown two cases of a gold crown attached to the second molar, and the tooth is involved to such an extent by caries and a pathologic condition as to be beyond restoration, indicating the extraction of the second molar.

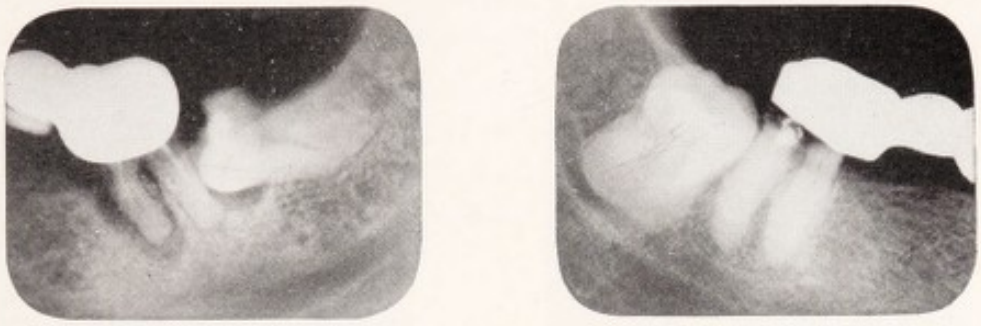


Fig. 202. — Second Molar Crowned. A gold crown attached to second molar, and caries and a pathologic condition involving tooth to such an extent that its extraction is indicated.

Occlusal Surface of Second Molar Above Corresponding Surface of First Molar.—The pressure of an impacted mandibular third molar upon the distal or distobuccal surface of the crown or distal root of the second may be so great as to deflect the latter tooth and produce a pronounced case of malocclusion. As an example of such a case, a comparison may be made, in the two cases shown in Fig. 203, of the occlusal surface of the second molar with the corresponding surface of the first, which will show the extent to which the occlusal surface of the second molar extends above the corresponding surface of the first. A clinical examination should be made of every case of impaction of the third molar for the possible presence of such a condition, as it indicates the early extraction of the impacted molar, in order that the patient may not suffer a disarrangement of the normal occlusion of the teeth. In cases of this kind the second molar is often

Fig. 203. — Occlusal Surface of Second Molar Above Corresponding Surface of First Molar. The pressure of mandibular third molar upon second has displaced occlusal surface of latter tooth so that it extends above first molar.

lost, in course of time, by the pressure of the impacted tooth upon the distal or distobuccal surface or root of the second molar.

Second Molar Impacted.—Where the second molar, in addition to the third molar, is impacted, the condition of the third molar is usually of such a nature that its extraction is indicated.

In Fig. 204 are shown four types of this character, and in such a case it is advisable to extract the more accessible tooth, which is usually the third molar, in advance of any other operative procedure, to be followed by the extraction of the second molar if the operator decides that such a course is advisable. The extraction of the second molar is executed by practically the same technic as an impacted mandibular third molar in a similar position.

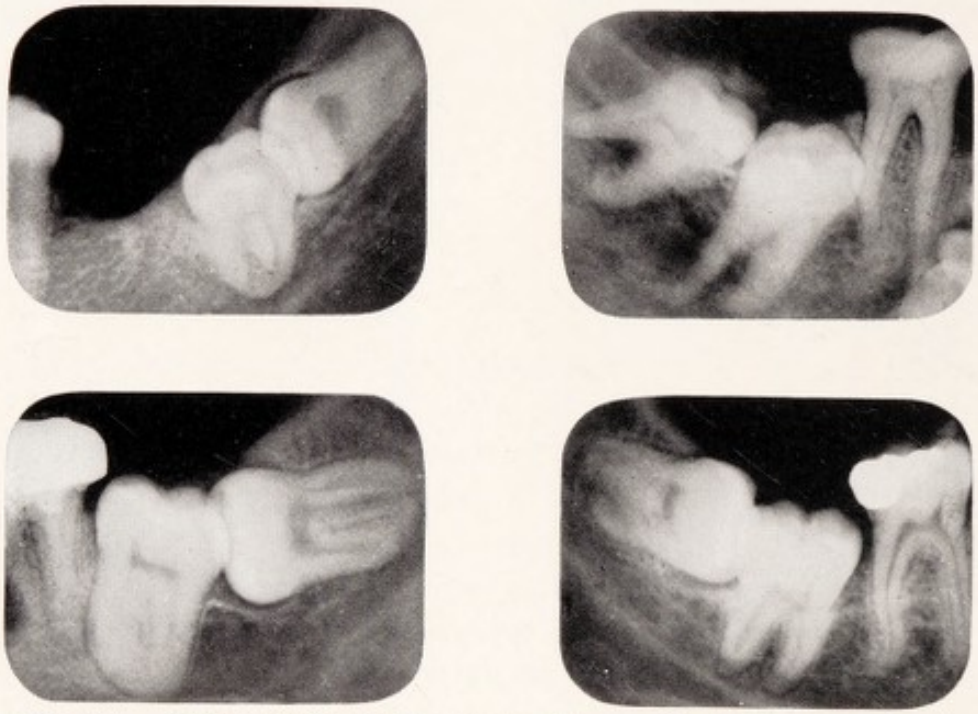


Fig. 204. — Impacted Mandibular Second Molar. Mandibular second molar, also third impacted.

In Fig. 205 are shown two types of an impacted mandibular second molar, with the third impacted and its roots partially developed. In some of these cases, after the extraction of the third molar, the second will assume its normal position and be a serviceable tooth.

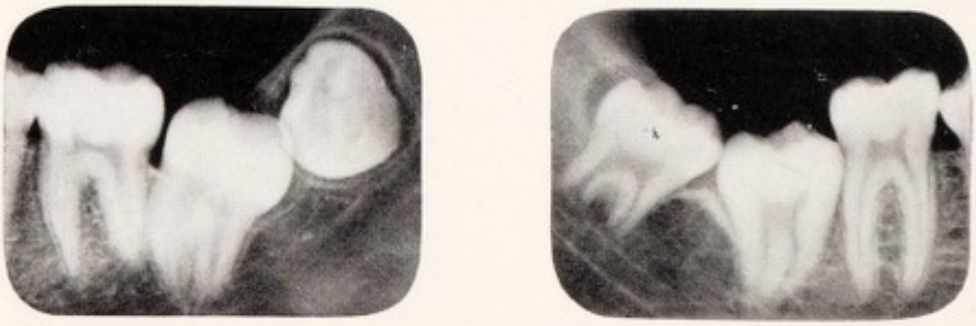


Fig. 205. — Impacted Mandibular Second Molar. Mandibular second molar, also third impacted, with roots of third molar partially developed.

Second Molar Extraction No Advantage.—Where the extraction of the third molar is indicated, there will be no advantage in first extracting the second molar for the reason that, after the operator has extracted the second molar and attempts the extraction of the third, he will find it necessary, especially if a forceps technic is to be followed, to excise the ossistructure on the buccal and lingual surfaces to be able to make an adjustment of the instrument. If an exolever technic is to be applied to the mesial surface of the third molar, it will be found that the ossistructure anterior to this tooth, on account of the presence of the empty socket, is not, as a rule, of sufficient firmness to serve as a fulcrum. Access with the exolever can, however, be readily obtained through the empty socket, but resting the instrument upon this area will not furnish a satisfactory fulcrum. It is often advisable, in a case where the second molar has been extracted and where conditions will permit, to extract the third molar at a later date, when bone regeneration has created a better support for the exolever.

Fig. 206. — Mesial Inclination of Second Molar. There is a mesial inclination of second molar due to missing first molar and pressure of impacted tooth against distal surface of second.

Crown of Second Molar Inclined Mesially.—Where the second molar is in a normal position, with the first molar missing and the third molar impacted, the pressure of the impacted tooth, in case it will not assume a normal position, will have a tendency to force the second molar mesially, and this is followed in some cases by an involvement of the distal surface or distal root of the second molar. In such a case the space between the first and second molars should be maintained by artificial means, or it may be a better procedure to extract the impacted tooth before it endangers the second molar. Especially will this precaution apply where the first molar has been recently extracted and insufficient bone regeneration has taken place, or the ossistructure anterior to the mesial root of the second molar is of a character that will not allow any pressure upon the latter tooth. In Fig. 206 are shown two radiograms of such a case, with a variation in the degree of the mesial inclination of the second molar.

CHAPTER IX

Radiographic Interpretation of the Roots of the Second Molar

WHERE the condition of the crown of the second molar has been analyzed in the radiogram, the character of its roots should also be determined. If the radiogram shows the second molar to have two distinct roots, surrounded by normal ossistructure, with a good septum, the tooth will not be endangered by the extraction of the impacted third molar, although in some cases the distal surface of the distal root of the second molar, owing to the position of the impacted tooth, may have been deprived of part of its supporting ossistructure. Where the roots, instead of having two distinct formations, are fused into a conical shape, and the impacted third molar impinges upon the distal surface of the root of the second molar, extreme care should be exercised in the extraction of the impacted molar, so that the second molar may not be disturbed.

The distal surface of the distal root of the second molar should be examined to ascertain whether there is any absorption on this surface caused by pressure from the impacted tooth. Where the roots of the second molar remain as the result of a fracture in a previous attempt to extract this tooth where the third molar was impacted, the relative position of the second molar roots and the third molar should be determined.

Fig. 207. — Fused Roots of Second Molar. Impacted mandibular third molar where second molar has fused roots.

Roots Fused.—In Fig. 207 are shown two cases where the second molar has fused roots and the third molar is impacted. The pressure of the impacted third molar against a second molar with such a root formation is usually sufficient to displace the crown of the latter tooth and cause the loss of the contact point between the first and second molars. Where the roots are fused, as shown in the radiogram, pre-

caution should be taken to avoid any pressure being applied against a second molar during the extraction of the third, and the second molar should be reinforced with the thumb of the left hand of the operator in order to protect the tooth from any disturbance during the extraction.

Pressure Absorption of Distal Surface of Distal Root of Second Molar.—When the operator is interpreting the condition of the roots of the second molar, he should carefully study the distal surface of the distal root for any pressure absorption if the contact with the third molar is at or below the gingival third of the second. If there is any doubt about the condition of the distal root of the second molar in such a case, several radiograms at different angles should be made to determine, if possible, to what extent the root of the second molar may be affected. The pressure of the crown of the third molar, in many cases where the contact of the crown extends from the gingival third toward the apical third of the root of the second molar, will cause destruction of the peridental membrane and produce a decided absorption of the distal surface of the distal root of the second molar.

The examination of the distal root of the second molar is very important, as the patient is entitled to the benefit of any doubt in regard to the probable condition of the second molar. The operator, whose decision will depend on his ability to interpret the radiogram properly, should determine whether the impacted third molar can be extracted without further disturbing the distal root of the second molar by the technic he intends to employ, and should decide, if the root is involved, on the procedure that it is advisable to follow in the interest of the patient.

The second molar should be retained, wherever possible, if it will be serviceable to the patient, but it should not be retained if the operator has reason to conclude that, after the impacted third molar has been extracted, the second molar will be a menace to the patient. It has been the experience of the author that the second molar, where the contact of the third molar is at or slightly below its gingival third, will not be affected by an extensive pressure absorption or be in a sensitive condition after the extraction of the third molar. Occasionally there will be a case with a very sensitive area, but this condition can be reached and controlled by topical medication. Where the contact of the crown of the third molar is in the region of the middle or apical third of the distal root of the second, it will be practically impossible to control the absorption at these points after the impacted tooth is extracted.

The importance of having a radiogram correctly made, so that the existing conditions in a case will be clearly defined, especially where

A

B

Fig. 208. — Pressure Absorption of Distal Surface of Distal Root of Second Molar. *A*, enlarged radiogram, incorrectly made, of a mandibular third molar impacted in a horizontal position, with its entire occlusal surface made to appear as though it overlaps distal root of second molar; *B*, radiogram of same case, correctly made, with no overlap of first molar upon second, but an extensive pressure absorption is shown on distal root of second molar; *C*, second molar after extraction.

the retention of a valuable tooth is involved, is demonstrated in the case presented in Fig. 208.

In Fig. 208 A is shown an impacted mandibular third molar in a horizontal position, with its entire occlusal surface made to appear as if it overlaps the distobuccal surface of the distal root of the second. The radiogram has been purposely made in an incorrect manner to show how an absorption on the distal surface of the distal root of the second molar can be obscured by a false overlap of the crown of the third molar upon the distal root. If in such a case the operative procedure is instituted according to the apparent condition in the radiogram, the second molar, after the extraction of the impacted third, will be a constant menace to the patient. The clinical examination in such a case will present sufficient evidence to warrant a thorough examination of the second molar, as there is usually some discomfort associated with that tooth, accompanied by a certain degree of sensitiveness to any pressure that may be applied. The apparent overlap of the first molar upon the second, where there is actually no overlap, indicates that the radiogram has not been correctly made, and, in addition to this evidence, there is no definition of the enamel cap, pulp chamber and roots of the first or second molar.

In Fig. 208 B is shown the radiogram correctly made, with no overlap of the first molar upon the second, and presents a clear definition of the enamel cap, pulp chamber and roots of the latter tooth. The radiogram shows an extensive pressure absorption on the distal surface of the distal root, indicating that the affected area is beyond restoration and that the extraction of the second molar is the proper procedure.

In Fig. 208 C is shown a radiogram of the tooth after its extraction, which clearly defines the area of absorption on the distal root of the second molar.

In Fig. 209 is shown a second molar, in which is clearly defined a pressure absorption on the distal surface of the distal root of the tooth, indicated by an arrow. The extent of the surface involved varies

Fig. 209. — Pressure Absorption of Distal Surface of Distal Root of Second Molar. A clearly defined pressure absorption of distal surface of distal root of second molar, indicated by an arrow.

in different cases, and it is sometimes difficult to determine from the radiogram the presence of an absorption. In this case the radiogram did not show any involvement of the distal root of the second molar. For some time after the extraction of the third molar the patient experienced discomfort, the affected area not being revealed by the radiogram, and relief was not obtained until the second molar was extracted, when the absorbed surface was revealed.

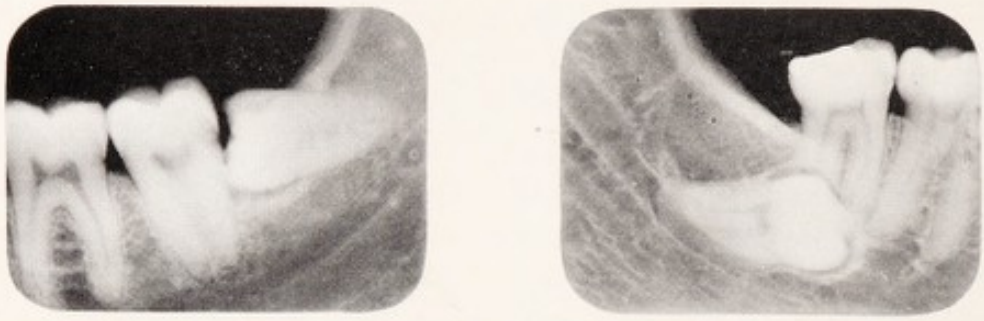


Fig. 210. — Pressure Absorption of Distal Surface of Distal Root of Second Molar. Impacted mandibular third molar, with pressure absorption of distal surface of distal root of second.

In Fig. 210 are shown two cases affected by pressure absorption, with variation in the character of the impaction. Where the third molar is extracted in a case of this kind and the second is retained, the distal surface of the latter tooth will usually be so sensitive from its previous contact with the third molar that the patient will suffer

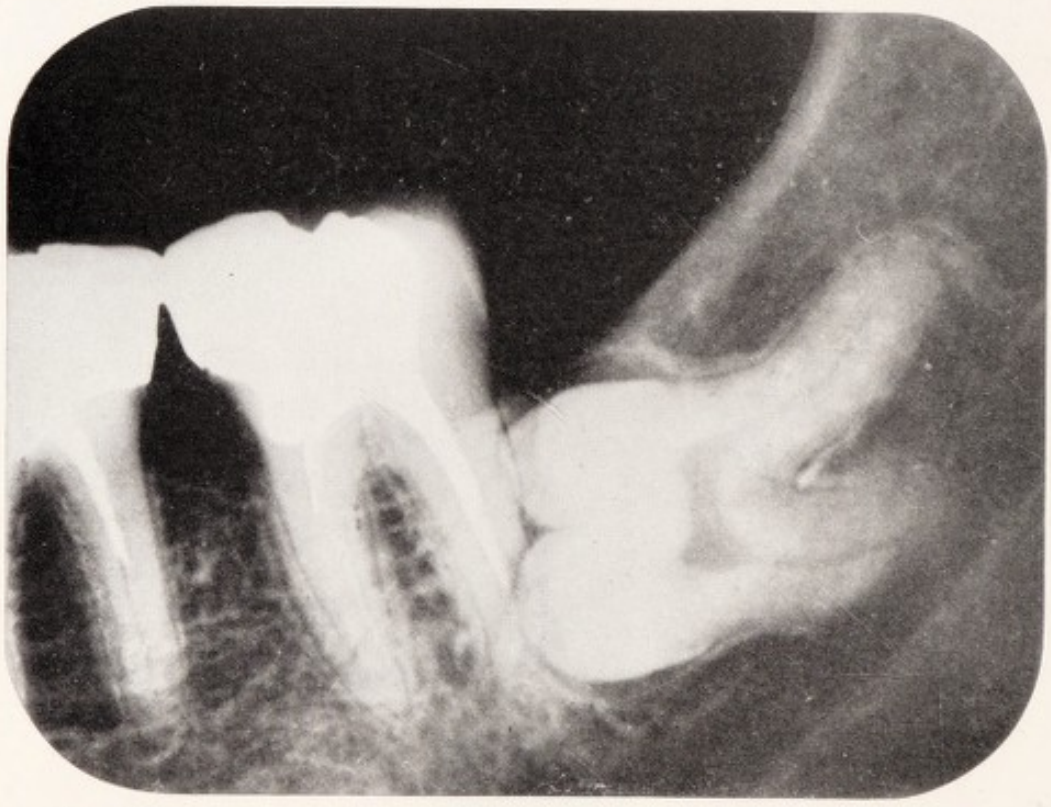


Fig. 211. — Pressure Absorption of Distal Surface of Distal Root of Second Molar. An enlarged radiogram of an impacted mandibular third molar, where there is pressure absorption of apical third of distal root of second.

continous pain, which will be aggravated on account of the third molar not being present to protect the exposed area.

Where the second molar has been previously treated, i. e., where the pulp has been removed and the cavity has been filled, and there is an absorption of the distal root, as shown in Fig. 211, there should be no hesitancy in extracting the second molar to relieve the condition.

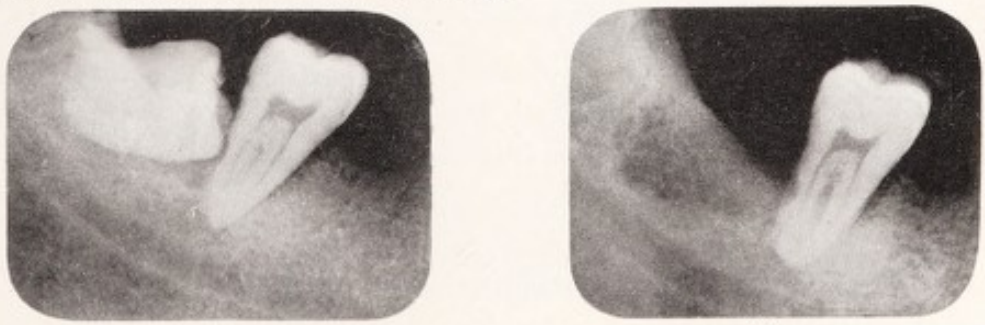
Where, in such a case, the second molar is to be extracted, it is advisable not to extract the impacted tooth at the same time, if it is possible to follow such a course, but to allow the repair of the ossi- structure that has been affected by the extraction of the second molar.

In Fig. 212 are shown two radiograms of a case where a bridge was attached to the second, with the third molar impacted, and there is an absorption on the distal surface of the distal root of the second. In Fig. 212 A is shown the condition before operation, and in Fig. 212 B is shown the condition after the operation. A comparison should be made of the two radiograms.

A B

Fig. 212. — Pressure Absorption of Distal Surface of Distal Root of Second Molar. Same case, showing pressure absorption of distal surface of distal root of second molar. *A*, condition before operation; *B*, condition after operation.

In Fig. 213 are shown two radiograms of the same case where the second molar is unsupported by the first molar, with an absorption on the distal surface of the distal root of the second molar. In Fig. 213 A is shown the condition before the operation, and in Fig. 213 B is shown the condition after the operation. The second molar was extracted at a later date, as bone regeneration was not favorable and the tooth was a constant irritation to the patient.



A B

Fig. 213. — Pressure Absorption of Distal Surface of Distal Root of Second Molar. Same case, showing pressure absorption of distal surface of distal root of second molar. *A*, condition before operation; *B*, condition after operation.

In Fig. 214 is shown an enlarged radiogram of a mesioangular type of impaction where the pressure of the third molar at the gingival third of the distal root of the second has caused an absorption on the latter tooth at the point of contact, making the retention of the second molar a problematical matter. The extraction of the second molar is indicated, especially where the absorption is as low as it is in this case.

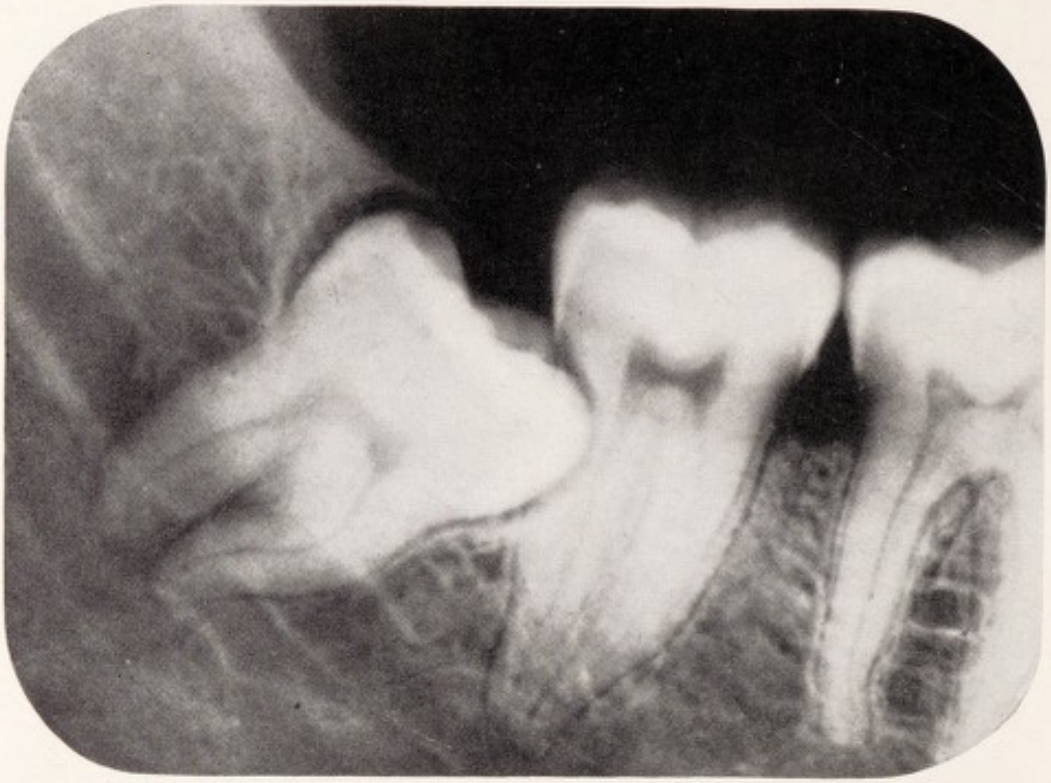


Fig. 214. — Pressure Absorption of Distal Surface of Distal Root of Second Molar. An enlarged radiogram of a mandibular third molar impacted in a mesioangular position, where pressure of third molar has caused an absorption at gingival third of distal root of second.

In Fig. 215 is shown an enlarged radiogram of a horizontal type of impaction where the pressure of the third molar has caused absorption of the apical third of the distal root of the second, and the extraction of the second molar is indicated, as no doubt any disturbance that may be present is due to absorption.

In Fig. 216 is shown a case where the pressure of the third molar has caused absorption of the middle third of the distal root of the second, and, in addition, the peridental membrane on the mesial surface of the mesial root of the third molar has become involved.

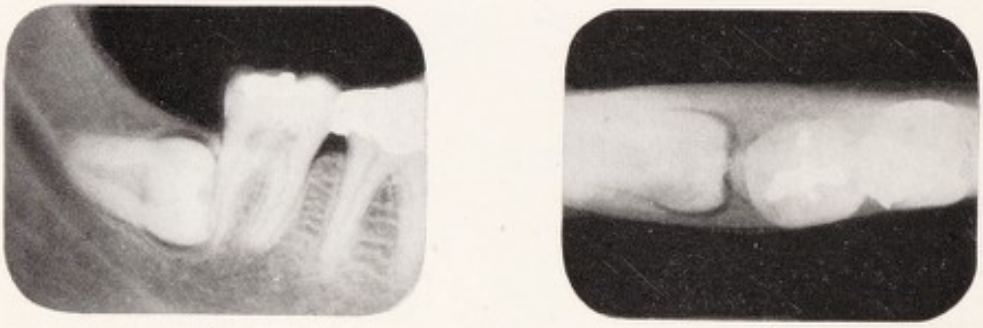
In Fig. 217 are shown two radiograms of the impacted mandibular third molar where the occlusal surface impinges upon the apical third of the distal root of the second, but no absorption is shown. The value of the second molar as a serviceable tooth after the extraction of the third would in these cases be problematical, as there is usually an involvement caused by pressure.

Fig. 215. — Pressure Absorption of Distal Surface of Distal Root of Second Molar. An enlarged radiogram of a mandibular third molar impacted in a horizontal position, where pressure of third molar has caused absorption of apical third of distal root of second.

Fig. 216. — Pressure Absorption of Distal Surface of Distal Root of Second Molar. An enlarged radiogram of an impacted mandibular third molar, where pressure of third molar has caused absorption of middle third of distal root of second molar, with peridental membrane involved on mesial surface of mesial root of latter tooth.

Fig. 217. — Impingement of Occlusal Surface of Third Molar Upon Distal Root of Second Molar. Impacted mandibular third molar, where occlusal surface of that tooth impinges upon apical third of distal root of second molar, but no absorption is shown. The value of second molar after extraction of third in these cases is problematical.

In Fig. 218 are shown lingual and occlusal views of the horizontal type of impaction where the pressure of the third molar at the apical third of the distal root of the second has caused an absorption on the latter tooth at the point of contact. In Fig. 218 A the lingual view shows the extent of absorption of the distal root, and the retention of the second molar would not be of any value after the extraction of the impacted tooth. In Fig. 218 B is shown the occlusal view, which was made with the object of determining the possibility of the absorption by checking the condition with this view, but in this instance, however, it was not practicable.



A B

Fig. 218. — Lingual and Occlusal Radiograms of a Case of Pressure Absorption of Distal Root of Second Molar. *A*, lingual view with an absorption of apical third of distal root of second molar; *B*, occlusal view with no evidence of pressure absorption.

Contact of Roots.—Where the mesial surface of the mesial root of the third molar is in contact with the distal surface of the distal root of the second, the latter tooth is carefully studied as to its relation to the mesial root of the third molar, and this condition is described under "Contact of the Mesial Root of Third Molar with Distal Root of Second Molar" (page 122).

Alignment Vertically of Distal Root of Second Molar with Distal Surface of Crown.—In the radiogram the alignment vertically of the distal surface of the distal root of the second molar should be compared with the distal surface of the crown. The distal surface of the distal

root of the second molar may or may not be in alignment vertically with the distal surface of the crown. Where, however, the distal root is out of alignment vertically with the distal surface of the tooth, and the occlusal surface of the third molar impinges upon the distal and buccal surfaces of the second, an occlusal radiogram will show the part of the root that is out of alignment vertically with the distal surface of the second molar. When interpreting the lingual and occlusal radiograms in a case of this character, the alignment should be carefully considered in order that the operator may determine the extent of the deflection when comparing these radiograms. In the execution of the operative technic the contact of the crown of the third molar with the distal surface of the second, and the variation in the alignment, will determine to some extent the line of approach with the exolever or ossisector.

Roots of Second Molar Remaining.—Occasionally a case will be presented where an attempt has been made by another operator to extract an impacted mandibular third molar without making a radiogram to ascertain the position of the tooth or the condition of the ossistructure

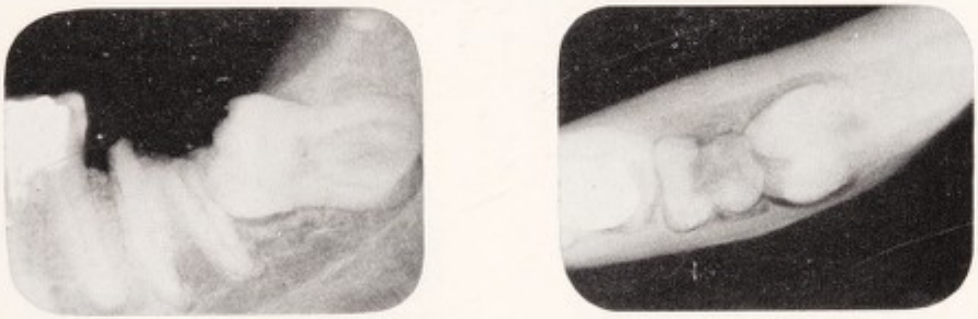


Fig. 219. — Roots of Second Molar Remaining After Attempted Extraction. A case of impacted mandibular third molar where an attempt was made to extract second molar, which resulted in a failure to extract latter tooth.

surrounding the tooth, resulting in a failure in the extraction. The procedure usually followed in such a case by the previous operator is an effort to extract the second molar in the hope of simplifying the extraction of the impacted tooth, and frequently this attempt will result in a fracture of the crown of the second molar, leaving *in situ* the roots of this tooth and also the impacted tooth, as shown in Fig. 219, where lingual and occlusal radiograms of a case of this character are shown.

If in the case of a fracture of the second molar the clinical examination or radiographic interpretation at the time the case is presented indicates that the third molar is the greater disturbing factor, the extraction of the impacted tooth should be made in advance of the extraction of the roots of the second molar, as the latter may serve as a fulcrum for the exolever. If, however, the greater disturbance is associated with the roots of the second molar, the roots of this tooth

should be extracted first. The extraction of the third molar and the roots of the second at the same sitting should be avoided when possible, so that the size of the resulting wound may be as small as conditions will permit. It would be quite an advantage, where the roots of the second molar are extracted in advance of the third, to permit the impacted tooth to remain until bone regeneration in the socket of the second molar has stabilized the ossistructure so that a better fulcrum can be obtained when the impacted tooth is extracted.

CHAPTER X

Radiographic Interpretation of the Ossistructure of the Second Molar

AFTER the condition of the crown and roots of the second molar has been determined from the radiogram, the supporting ossistructure is studied to determine its relation to the roots of the tooth, and to ascertain whether the impacted third molar or a pathologic condition has involved the ossistructure.

Pathologic Condition Involving Distal Surface of Distal Root.—In Fig. 220 are shown two cases of the impacted mandibular third molar where a pathologic condition has involved the entire distal surface of the distal root of the second. Where the impacted third molar can be extracted without disturbing the second, bone regeneration will take place in an occasional case, and the second molar can be made serviceable to the patient. The majority of such cases, however, do not respond to treatment after the extraction of the impacted tooth.

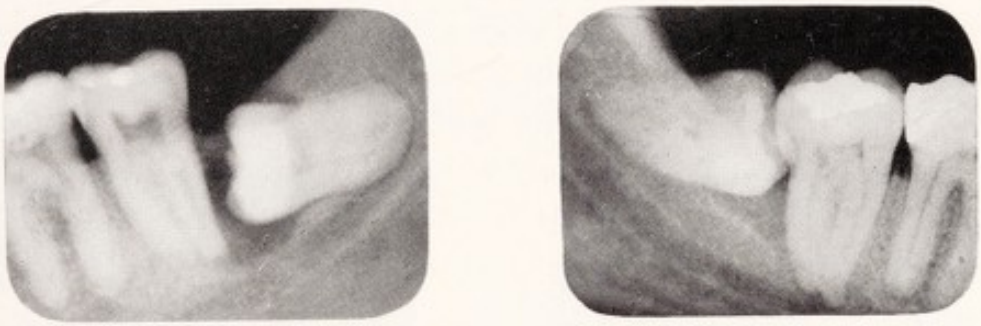


Fig. 220. — Pathologic Condition Involving Distal Surface of Distal Root of Second Molar. Impacted mandibular third molar, where a pathologic condition has involved entire distal surface of distal root of second.

In Fig. 221 is shown an enlarged radiogram of an impacted mandibular third molar where the entire distal surface of the root of the second is involved by a pathologic condition. The presence of a space between the occlusal surface of the third molar and the distal surface of the second is not unusual in this type of impaction and is susceptible to infection. The ossistructure on the distal surface of the second molar is destroyed to such an extent that the tooth should be sacrificed, as bone regeneration will rarely be sufficient, after the extraction of the third molar, to support the distal surface of the distal root of the second.

In Fig. 222 are shown two cases of the impacted mandibular third molar where a pathologic condition has involved the distal surface of

Fig. 221. — Pathologic Condition Involving Distal Surface of Distal Root of Second Molar. An enlarged radiogram of impacted mandibular third molar where a pathologic condition has involved entire distal surface of distal root of second molar, and extends below mesial surface of third molar.

the distal root of the second and the septum. The extraction of the second molar is indicated in these two cases, as the preservation of that tooth is not possible in view of the existing involvement.

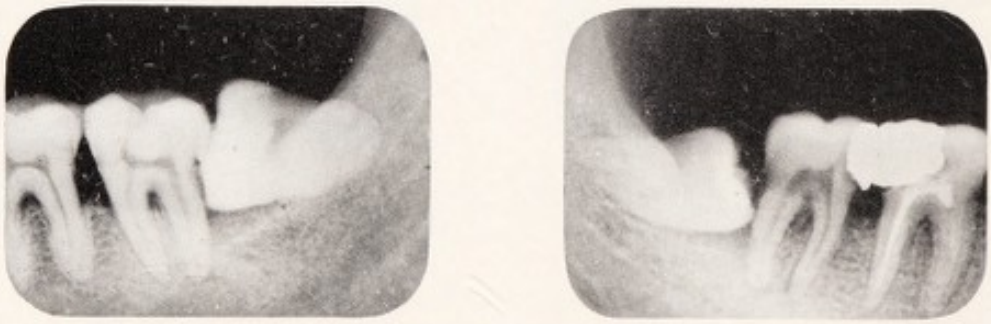


Fig. 222. — Pathologic Condition Involving Distal Surface of Distal Root and Septum of Second Molar. Impacted mandibular third molar where a pathologic condition has involved distal surface of distal root and septum of second molar.

Pathologic Condition Involving Mesial Surface of Mesial Root.— In Fig. 223 are shown two cases of the impacted mandibular third molar where the ossistructure supporting the mesial surface of the mesial root of the second is involved by a pathologic condition to such an extent that the retention of this tooth is problematical. The condition of the third molar, in its relation to the second and its supporting ossistructure, is determined from the radiogram when the operative procedure for the extraction of the impacted molar is being considered.

If pressure is applied in such a case to the second molar, this tooth will be disturbed during the extraction of the impacted molar, as the ossistructure supporting the second molar is involved to a great extent. Where this condition prevails, the operator should endeavor to determine the value of both the second and third molars to the patient, and, in case the operator concludes that the third molar will assume its normal position and that the ossistructure supporting the second cannot be corrected, it will be advisable to extract the second molar and allow the third molar to assume its position in the arch.

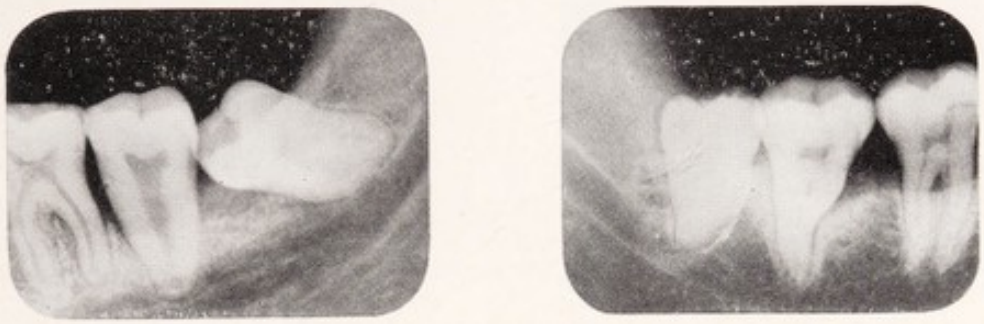


Fig. 223. — Pathologic Condition Involving Mesial Surface of Mesial Root of Second Molar. Impacted mandibular third molar where ossistructure supporting mesial surface of mesial root of second molar is involved by a pathologic condition to such extent that its retention is problematical.

Where the condition described above is present, the roots of the second molar are usually of a conical shape and the tooth is readily displaced when the slightest pressure is applied.

Pathologic Condition Extending Entirely Around Roots.—In Fig. 224 are shown two cases where a pathologic condition extends entirely around the roots of the second molar and the extraction of the tooth is indicated.

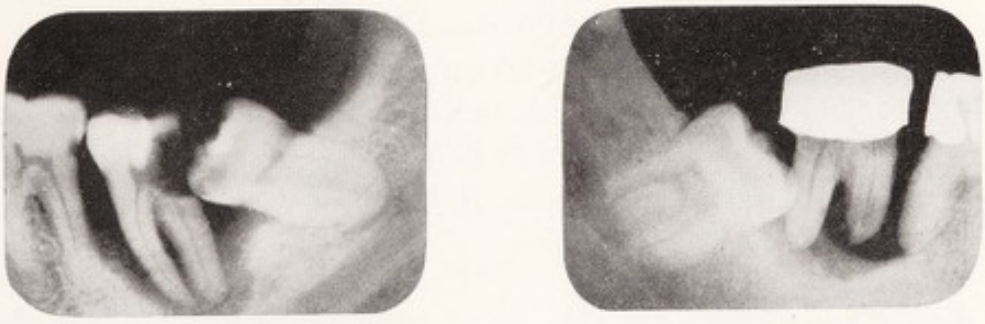


Fig. 224. — Pathologic Condition Extending Entirely Around Roots of Second Molar. Impacted mandibular third molar where pathologic condition has involved entire ossistructure around roots of second.

Distal Surface of Distal Root Without Supporting Ossistructure.—In Fig. 225 are shown two cases of the impacted mandibular third molar where there is no pathologic condition involving the ossistructure, but after the extraction of the impacted molar there will not be sufficient ossistructure on the distal surface of the second to support

this tooth, and it will not be unusual to find an absorption on the distal surface of the distal root of the second molar.

Pathologic Condition Involving Ossistructure of Apical Third of Roots.—In addition to the diagnostic points mentioned, the condition of the apical third of the second molar should be ascertained, especially if this tooth has been treated, filled or crowned.

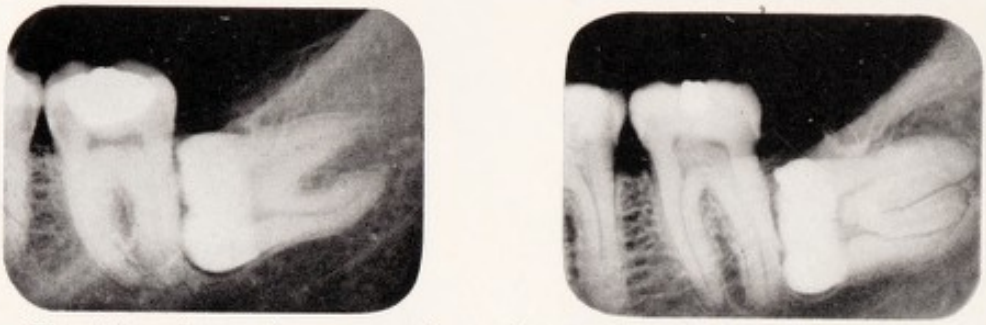


Fig. 225. — Distal Surface of Distal Root of Second Molar Without Supporting Ossistructure. Impacted mandibular third molar, where there will not be sufficient ossistructure on distal surface of distal root of second molar to support it after extraction of impacted tooth. The root is usually involved as result of pressure from impacted tooth.

In Fig. 226 are shown two cases of the impacted mandibular third molar where the apical third of the roots of the second are involved to such an extent that the tooth is beyond remedial treatment and will not be of future service to the patient. This is another example of the importance of making a radiogram, not only of the third molar, but also of the second molar, as without such precaution the operator may extract the third, allowing the second molar to remain, and the patient will continue to suffer from the morbid condition of the latter tooth.

Any pathologic condition involving the roots of the second molar will usually interfere with the healing of the socket of a third after the latter tooth has been extracted. If the affection of the second molar can be corrected, and if the immediate extraction of the third is not indicated, the better plan will be to correct the morbid condition of the second molar before any operation is undertaken on the impacted third. If, however, the second molar is to be extracted at once, the operation should be done, wherever possible, in advance of the extraction of the impacted third molar.

Fig. 226. — Pathologic Condition Involving Ossistructure of Apical Third of Roots of Second Molar. Impacted mandibular third molar where apical third of roots of second is involved by pathologic condition.

Involvement of Pulp of Second Molar.—The apical third of the second molar should be studied in the radiogram to determine whether there is any pathologic involvement as a result of pressure of the third molar against the second, a condition that is frequently found.

Where the pulp of the second molar has not been involved and where there is a marked contact of the impacted tooth with the second molar, it should be a routine procedure to test the second molar for vitality before the impacted tooth is extracted.

CHAPTER XI

Radiographic Interpretation of the Mandibular First, Second and Third Molars

INVOLVEMENT OF THE MANDIBULAR FIRST MOLAR

First Molar Involved by a Pathologic Condition.—In Fig. 227 are shown two cases where a pathologic condition has involved the apical third of the mandibular first molar, with the third molar impacted. Where the extraction of the first molar is indicated, and there is a possibility of the impacted third molar assuming its approximately normal position, the patient should be given the benefit of the doubt by the extraction of the first molar with the expectation that the third molar will assume its position in the arch. There will be a tendency of the second molar to move in a mesial direction after the extraction of the first molar, and the operator should endeavor to determine the probability of the third molar assuming its position after the extraction of the first molar.

Fig. 227. — Pathologic Condition Involving Mandibular First Molar. Pathologic condition involving apical third of mandibular first molar, with third molar impacted.

Where the radiogram shows a pathologic involvement of the mandibular first molar, with the third molar impacted, and the extraction of both teeth is indicated, the decision as to which tooth should be extracted first is governed by prevailing conditions. It is the opinion of the author that where such a pathologic condition exists, the tooth that causes the greater discomfort should be extracted first, and after a few days, when the discomfort has disappeared, the operation on the other tooth should follow. Where, however, immediate operation on the impacted tooth is not contraindicated, it is extracted in advance of the first molar, as the latter tooth will stabilize the second molar.

Interseptum Between First and Second Molars Involved by a Pathologic Condition.—In Fig. 228 are shown two cases of the impacted mandibular third molar where the interseptum between the first and second molars is involved by a pathologic condition to such an extent that after the extraction of the impacted tooth, should such a procedure be followed, attention should be directed to the involvement of the interseptum. Any pressure upon the second molar during the extraction of the third will endanger the former tooth. The diagnosis in such a case is to determine, by clinical examination and radiographic interpretation, the extent to which the interseptum is involved and how much supporting ossistructure will be on the distal surface of the second molar after the impacted tooth has been extracted. If the condition of the interseptum, in case it is involved, can be corrected, and if there is sufficient ossistructure on the distal surface of the second molar to support this tooth after the third molar has been extracted, the second molar should be retained. Where, however, conditions are not favorable for this procedure, the second molar should be extracted.

Fig. 228. — Involvement of Interseptum Between First and Second Molars. Impacted mandibular third molar where interseptum between first and second molars is involved.

INVOLVEMENT OF THE SECOND AND THIRD MOLARS

Fillings in Second and Third Molars.—A case will occasionally be presented where the crowns of the second and third molars have been filled. In Fig. 229 are shown two cases of this character, and where such a condition exists it should be closely studied to determine the operative procedure to be instituted.

In some cases the filling in the second molar is liable to be disturbed, and precaution should be taken not to endanger this tooth further. Care should be exercised that no particles of the filling that may be displaced from either the second or third molar fall into the socket of the extracted third molar, as such particles are difficult to remove. If the filling in the second molar is in good condition, it should not be disturbed; but, if it is not in good condition and is disturbed, the patient should be informed of the fact, so that it may be restored as soon as possible after the extraction of the impacted tooth.

Second and Third Molars Involved by Caries.—Cases will occasionally occur where the crowns of both second and third molars are involved by caries. In Fig. 230 are shown two cases of this character, and, when such a condition is presented, a careful study should be made to determine the operative procedure to be instituted. In these cases, where the involvement of the second molar by caries on the distal surface is not sufficient to cause the tooth to be considered beyond repair, the extraction of the third molar should be executed so as not to involve further the second. Where, however, both crowns are destroyed to such an extent that neither tooth can be retained, the extraction of the third molar in advance of the second is, in the majority of cases, the procedure to follow, as in some instances the second molar can be utilized as a fulcrum for the extraction of the third.

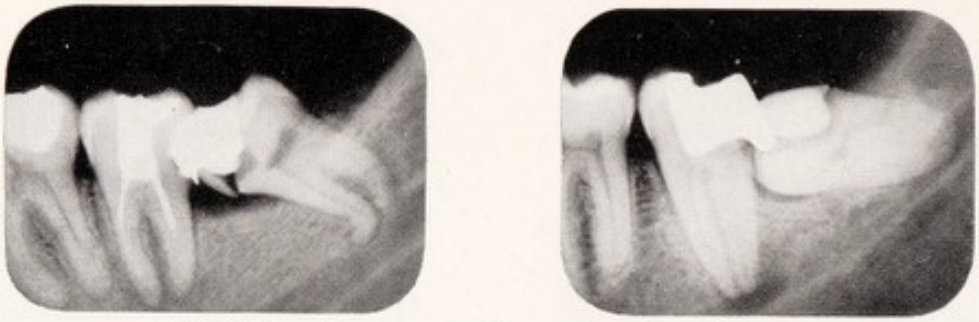


Fig. 229. — Fillings in Second and Third Molars.

Second and Third Molars Involved by a Pathologic Condition.—Where a pathologic condition involves the second and third molars, the condition is usually shown in the radiogram, and the extent of pathologic involvement of the second and third molars is determined.

When making a radiographic interpretation of the second and third molars, it is advisable to include the first molar in the interpretation.

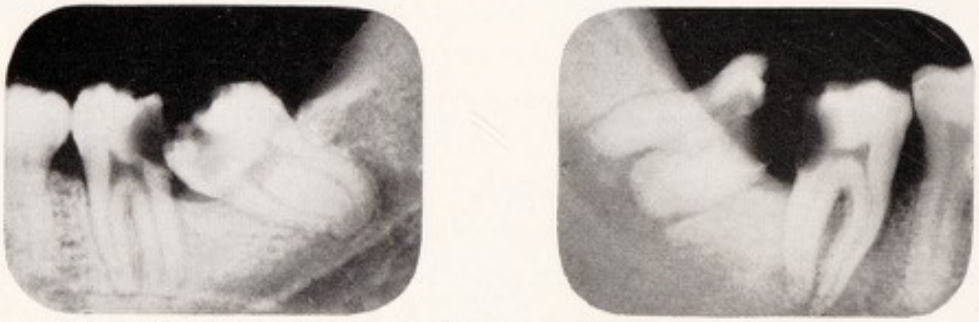


Fig. 230. — Caries Involving Crowns of Second and Third Molars.

Where, in addition to a pathologic condition involving the impacted third molar, the first and second molars are involved, as shown in Fig. 231, the clinical findings should govern the operative procedure as to which tooth should be extracted first. Where conditions surrounding the three teeth are of about the same character, the order

of extraction should be (1) the third molar, (2) the second molar and (3) the first molar. This order will permit the second and first molars, respectively, to serve as a fulcrum when applying the exolever.

Fig. 231. — First, Second and Third Molars Involved by a Pathologic Condition. Pathologic condition involving ossistructure supporting impacted third molar, as well as first and second molars.

CHAPTER XII

Radiographic Interpretation of the Various Mandibular Affections and Abnormalities

IN the interpretation of the crowns, roots and ossistructure of the mandibular second and third molars should be included the interproximal space, the peridental membranes of the two teeth mentioned and the relation of the mandibular canal to the impacted tooth. In addition to these interpretations, a study should be made for the presence of an odontoma or cyst in the region of the impacted tooth, and for such abnormalities as a supernumerary tooth, fourth molar and fusion of the third and fourth molars.

INTERPROXIMAL SPACE

The interproximal space, which is between two adjacent teeth—i.e., the space between the distal surface of the second molar and the mesial surface of the third—varies in size according to the position of the impacted tooth and its relation to the second molar and the contiguous ossistructure. In Chapter V a description is given of the mesial surface of the impacted third molar with reference to the accessibility or inaccessibility to this surface; in Chapter VII a description is given of the interseptum between the second and third molars, the ossistructure that may be anterior to the occlusal or mesial surface of the impacted tooth and the superior border of the ossistructure.

The interpretation of the interproximal space should embrace all of the diagnostic points mentioned above, so that the size and shape of the exolever blade, when being applied to the mesial or mesiobuccal surface of the third molar, will conform to the available space.

Where the third molar is impacted in a vertical or mesioangular position, with the mesial surface accessible, and where the tooth is not deflected lingually or buccally, there will be a variation in the available interproximal space. Where the tooth is deflected buccally, there will be a tendency to decrease the space. Where the tooth is deflected lingually, only a small part of the crown will be in contact with the distal surface of the second molar, and there will be a tendency to decrease the space. Where the tooth is deflected buccolingually, the part of the crown impinging upon the distobuccal surface of the second molar will have a tendency to decrease the space.

Where the third molar is impacted in a distoangular position, with the mesial surface accessible and the tooth not deflected, the space will vary from small to very large. Where the third molar is impacted in a horizontal position, with the mesial surface accessible and the tooth not deflected, the size of the space will vary. Where the tooth is deflected, the space will be increased or decreased according to the character of the deflection. Where the mesial surface is located below the superior border of the ossistructure and is inaccessible, the space will be obliterated.

Fig. 232.—Interproximal Space—Vertical Impaction. Vertical type of impacted mandibular third molar, showing variation in size of abnormal interproximal space.

When the crown of the third molar is directed distally with the exolever from its impacted position, the interproximal space will be increased, and the mesial surface will be placed some distance from the distal surface of the second molar, or from the ossistructure anterior to or below the mesial surface. This space will be a factor to be considered in the selection of the instruments to be engaged in directing the tooth farther distally, and it will be necessary to use blades of larger sizes according to the distance the tooth is directed from its original position.

In many cases the interproximal space is increased by a pathologic condition, and this condition must be considered in connection with the normal ossistructure. In Fig. 232 are shown two cases of vertical impaction with a variation in the size of the interproximal space. In Fig. 233 are shown two cases of mesioangular impaction with a

Fig. 233. — Interproximal Space—Mesioangular Impaction. Mesioangular type of impacted mandibular third molar, showing variation in size of abnormal interproximal space.

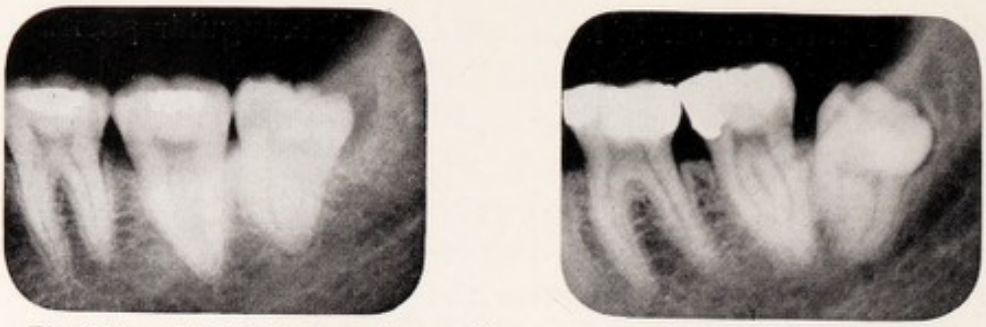


Fig. 234. — Interproximal Space—Distoangular Impaction. Distoangular type of impacted mandibular third molar, showing variation in size of abnormal interproximal space.

variation in the size of the interproximal space. In Fig. 234 are shown two cases of distoangular impaction with a variation in the size of the interproximal space. In Fig. 235 are shown two cases of horizontal impaction with a variation in the size of the interproximal space.

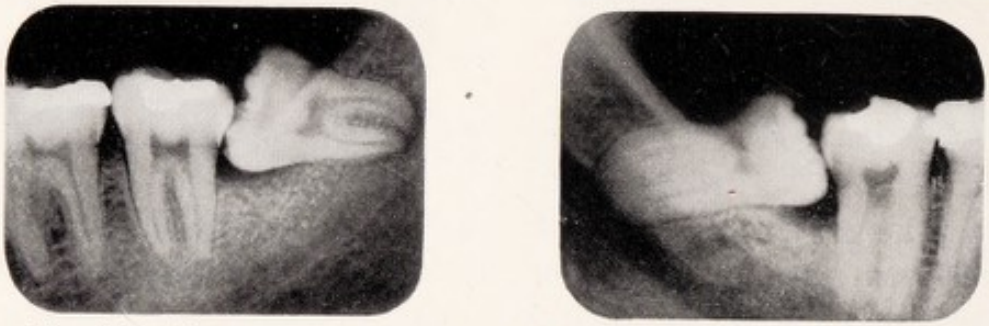


Fig. 235. — Interproximal Space—Horizontal Impaction. Horizontal type of impacted mandibular third molar, showing variation in size of abnormal interproximal space.

PERIDENTAL MEMBRANE OF THE THIRD MOLAR

Any involvement of the peridental membrane of the impacted mandibular third molar should be determined from the radiogram, as such a condition will have a tendency to lessen the amount of resistance that may otherwise be associated with the extraction of the tooth.

The density of the ossistructure in the region of the third molar is usually of such a character that the radiogram will not always indicate an involvement of the peridental membrane that may be present, and, where such an indication is absent, dependence will have to be placed on the clinical evidence.

An involvement of the peridental membrane is not, as a rule, associated with the impacted third molar. The treatment of the pulp chamber and canals of this tooth is not a common practice, and such involvement is found principally in those cases where a pathologic condition of the ossistructure of the third molar affects the greater part of the tooth. An impairment of the peridental membrane will occasionally be observable in a case where another operator has

Fig. 236. — Peridental Membrane of Third Molar. Enlarged radiogram of distoangular type of impacted mandibular third molar, showing peridental membrane affected as result of injury during an attempted extraction.

previously attempted to extract an impacted third molar, as the membrane in such a case will have been injured.

Fig. 237. — Peridental Membrane of Third Molar. Enlarged radiogram of vertical type of impacted mandibular third molar, showing peridental membrane affected as result of injury during an attempted extraction a long time previously, followed by destruction of ossistructure surrounding tooth.

In Fig. 236 is shown an enlarged radiogram of the distoangular type of impacted mandibular third molar where the peridental membrane of the impacted tooth is involved. The enlargement of the membrane is the result of an injury inflicted during an attempted extraction of the tooth with forceps, or with an exolever without excising the resisting ossistructure over the distoclusal surface.

In Fig. 237 is shown a case where the injury to the peridental membrane of the third molar was caused by an attempted extraction a long time previously, and the injury has been followed by destruction of the ossistructure surrounding the tooth.

PERIDENTAL MEMBRANE OF THE SECOND MOLAR

In Fig. 238 are shown two radiograms where the peridental membrane of the second molar is involved. The pressure of the impacted third molar against the second, especially where the roots of the latter tooth are fused, is often sufficient to cause a disturbance of the membrane of the second molar, and, when interpreting the radiogram, cognizance should be taken of such a condition so as not to injure further the second molar. When, however, the involvement is of such a nature that no recovery may be expected, the operative procedure should be executed as may be indicated by the condition presented.

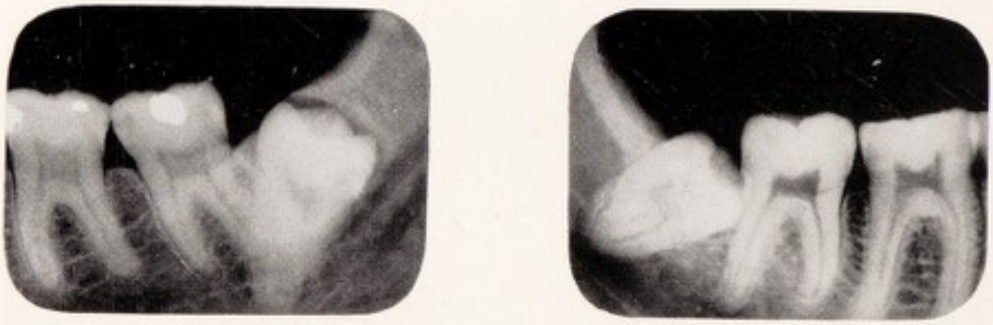


Fig. 238. — Peridental Membrane of Second Molar. Impacted mandibular third molar, showing involvement of peridental membrane on mesial surface of mesial root of second molar. The pressure of impacted third molar against second is often sufficient to cause a disturbance of membrane of latter tooth.

MANDIBULAR CANAL

The mandibular canal, when in proximity to the impacted tooth, is in most instances outlined in the radiogram. The operator should carefully observe the mandibular canal in its relation to the impacted tooth in order to avoid an injury to this canal during the extraction procedure. Formerly, when the forceps technic for the extraction of the impacted third molar was generally followed, injury frequently occurred to the mandibular canal. This injury resulted from the downward pressure of the forceps in their application on the tooth to secure

a firm hold with the beaks of the instrument for the purpose of extraction. By employing the exolever technic described in the various chapters on "Operative Technic," it will be observed that the exolever movements are made upward and distally in a horizontal impaction, while the exolever movements are made distally and upward in the other impactions, and that no downward pressure is placed upon the crown, as would be the case if forceps were used, thereby minimizing the probability of injuring the mandibular canal.

There is a variation in the location of the mandibular canal and its relation to the crown and roots of the impacted tooth.

In Fig. 239 are shown four radiograms where there is a variation in the location of the mandibular canal in its relation to the mesial surface and roots of the third molar. The radiogram will not, however, by any of the methods known at present, define the exact relationship between the tooth and the canal.

Experience has demonstrated that, with the employment of the exolever technic, no injury to the canal will follow, and that no attention need be given to it during the operative procedure unless it is in close proximity to the mesial surface to which the exolever is to be applied, in which case an operative procedure should be followed that will avoid the application of the exolever near the canal. Where, in the case of a fracture, the roots of an impacted tooth remain in the socket, the canal is liable to be injured if precaution is not taken in the application of the exolever, and especially should this precaution be taken when the roots are in a horizontal position.

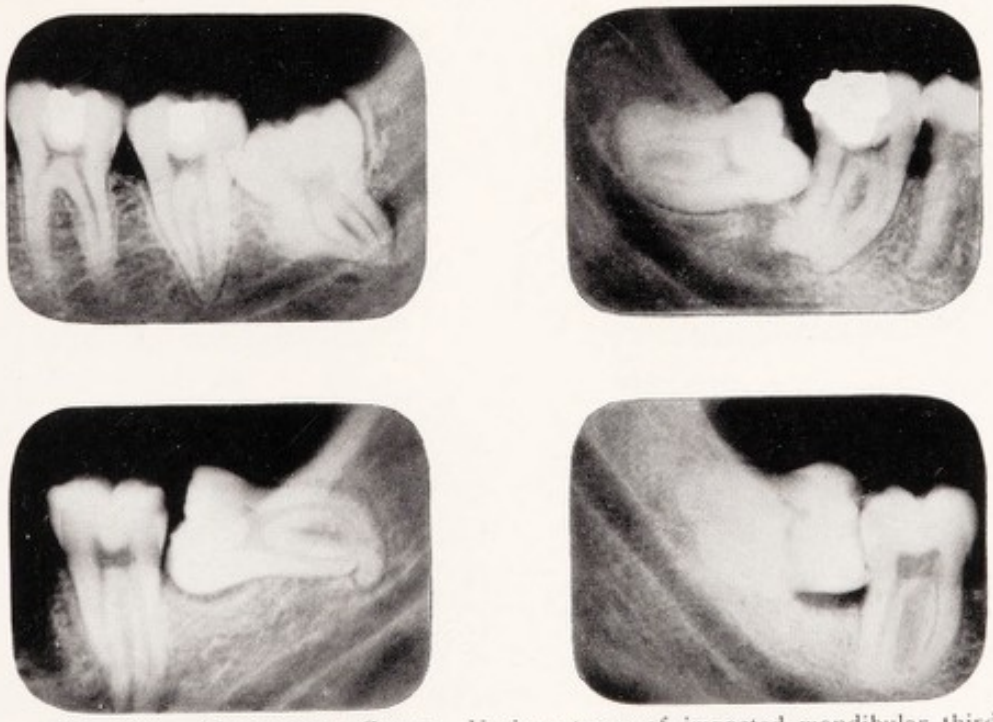


Fig. 239. — Mandibular Canal. Various types of impacted mandibular third molar, showing variation in location of mandibular canal and its relation to crown and roots of impacted tooth

ODONTOMA OVER THE CROWN OF THE IMPACTED THIRD MOLAR

On a rare occasion an odontoma may be found over the crown of an impacted third molar. In Fig. 240 is shown a radiogram where there is an odontoma over the crown of the impacted tooth.

Fig. 240. — Odontoma over Crown of Impacted Mandibular Third Molar. Large odontoma over crown of impacted mandibular third molar.

CYST

In Fig. 241 are shown four radiograms of a cyst in the region of the impacted third molar, and such a condition is occasionally associated with this tooth. Where the cyst is large, an extra-oral radiogram should be made in order that the entire cyst may be shown, as in such a case an intra-oral radiogram will not be large enough.

In Fig. 242 is shown an extra-oral radiogram of a large cyst involving the entire ramus on the right side of the mandible, with the impacted tooth located at the sigmoid notch of the ramus.

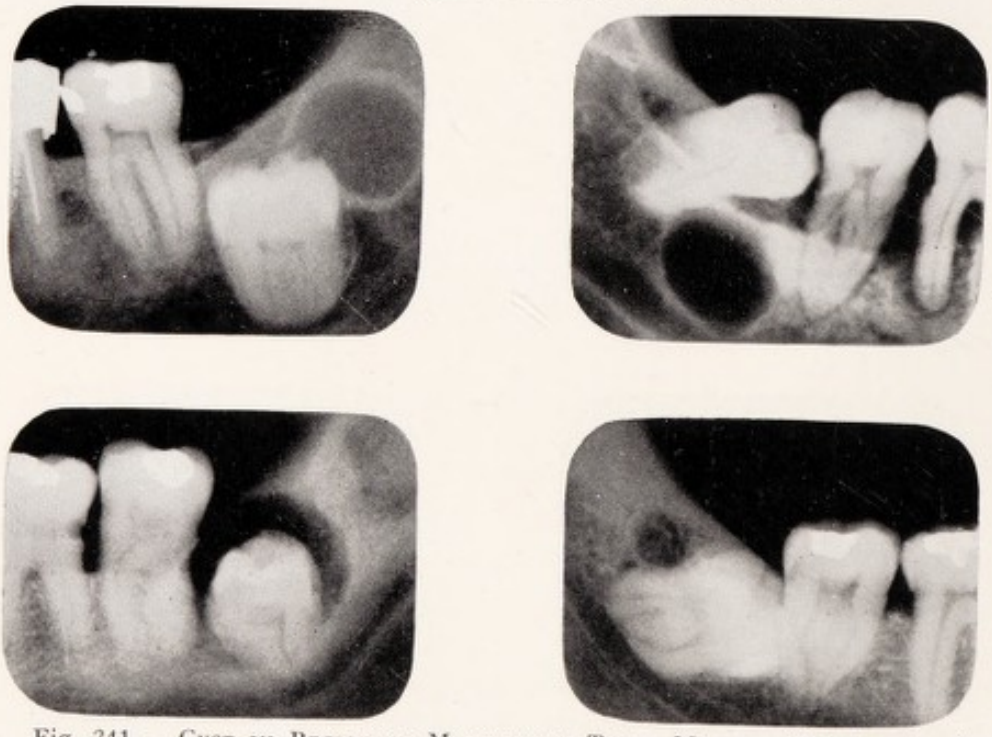


Fig. 241. — Cyst in Region of Mandibular Third Molar. Variation in size of cysts in region of impacted mandibular third molar.

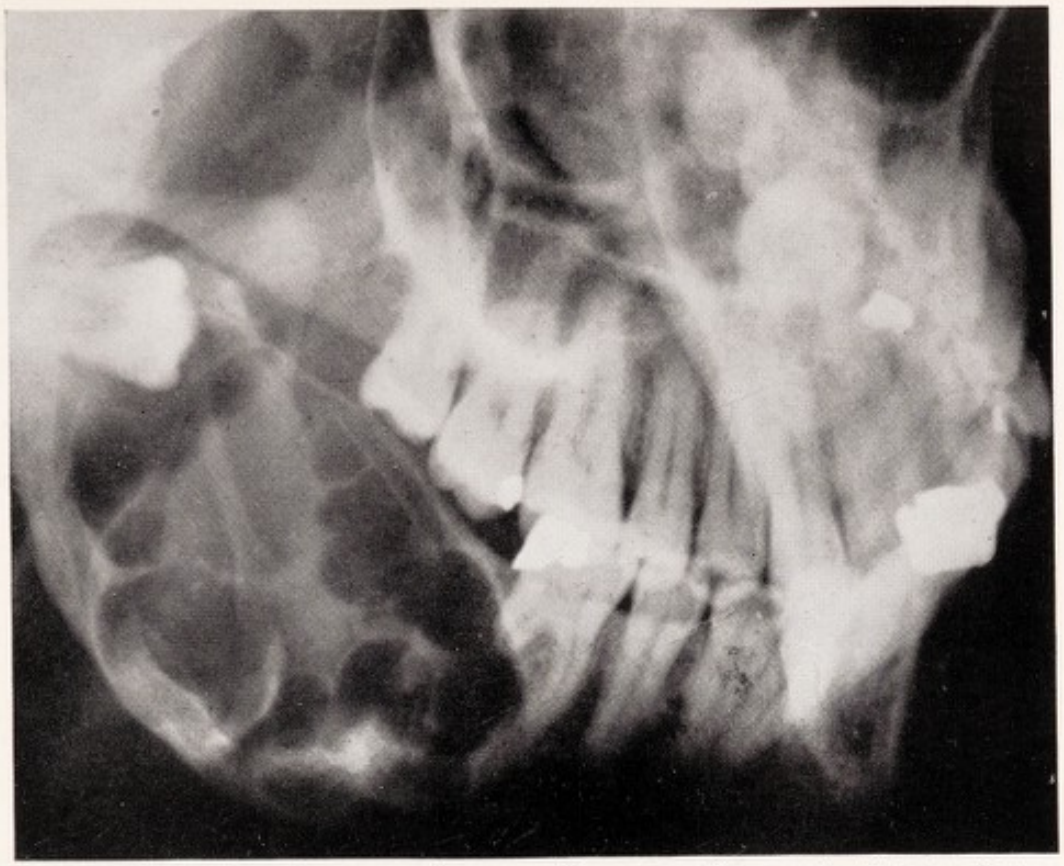


Fig. 242. — Cyst Involving Ramus of Mandible. Extra-oral radiogram showing a cyst involving entire ramus on right side of mandible, with impacted tooth at sigmoid notch of ramus.

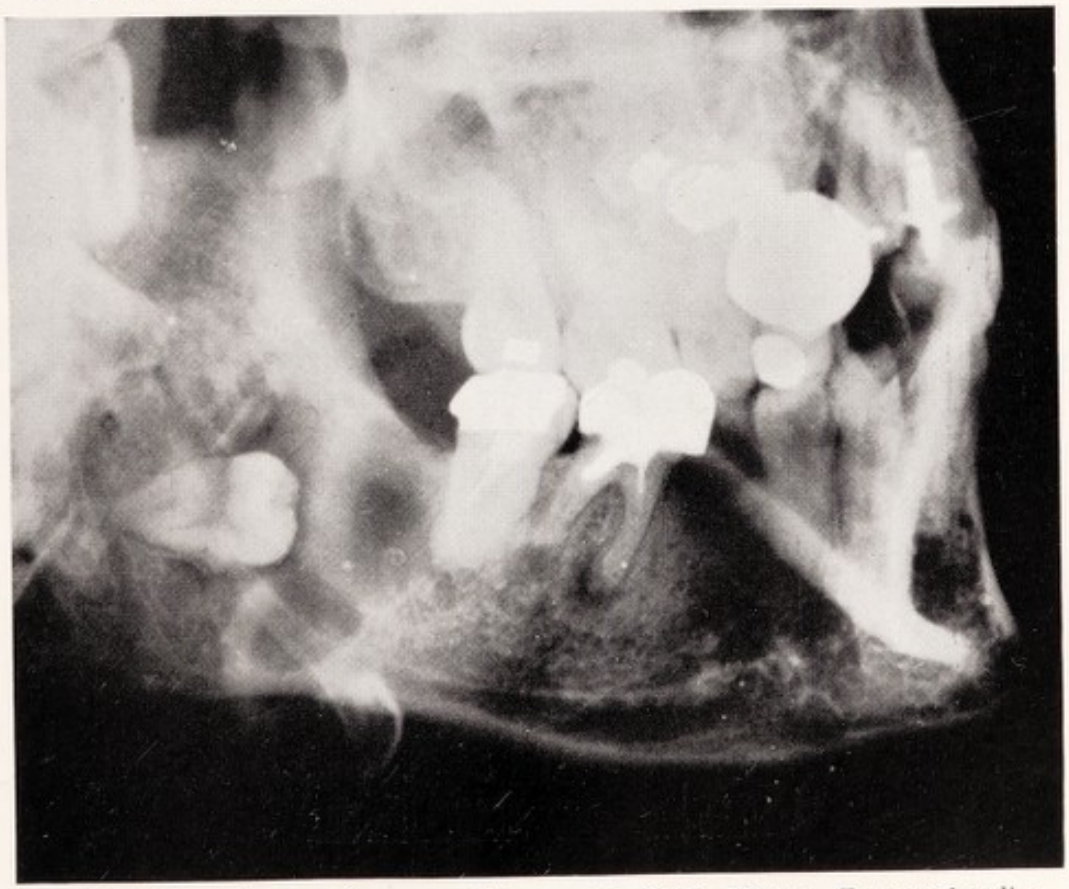


Fig. 243. — Cyst in Region of Mandibular Third Molar. Extra-oral radiogram showing a cyst in region of impacted mandibular third molar, with third molar in a horizontal position at angle of ramus.

In Fig. 243 is shown an extra-oral radiogram of a cyst in the third molar region, extending to the lower border of the mandible, which has caused the third molar to assume a horizontal position at the angle of the ramus.

SUPERNUMERARY TOOTH

On a very rare occasion a supernumerary tooth may be found over the occlusal surface of the impacted third molar, or it may be mesial or distal to the crown of that tooth. The extraction of such a supernumerary tooth is not a difficult procedure, as it can be readily extracted in advance of the operation on the impacted tooth.

A

B

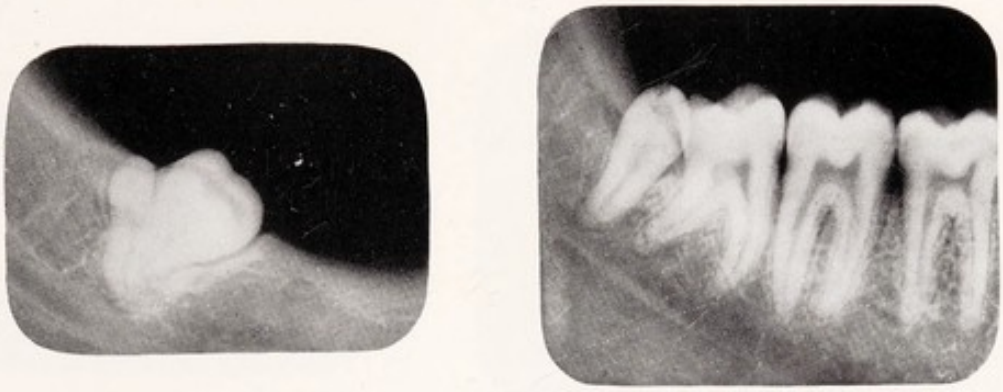
C

Fig. 244.—Supernumerary Tooth. *A*, supernumerary tooth mesial to occlusal surface of impacted mandibular third molar; *B*, supernumerary tooth has been extracted; *C*, socket after extraction of impacted tooth.

In Fig. 244 are shown three radiograms of a very interesting case, where the supernumerary tooth was located between the occlusal surface of the third molar and the distal surface of the second.

In Fig. 244 A the supernumerary tooth is shown located mesial to the occlusal surface of the third molar; in Fig. 244 B the tooth is shown extracted, with a pathologic condition mesial to the occlusal surface, and in Fig. 244 C is shown the socket after the extraction of the impacted tooth.

In Fig. 245 are shown two radiograms of supernumerary teeth. In Fig. 245 A is shown a radiogram of a supernumerary tooth located distal to an isolated third molar, to which the supernumerary tooth is fused. In Fig. 245 B is shown an impacted supernumerary tooth.



A B

Fig. 245. — Supernumerary Tooth. *A*, mandibular third molar, with a supernumerary tooth fused to distal surface of distal root; *B*, impacted supernumerary tooth.

FOURTH MOLAR

In Fig. 246 is shown a very interesting case, which, in addition to being unusual, clearly demonstrates the importance of making a radiogram of every mandibular third molar that is to receive attention, especially when the tooth is impacted. In this case a part of the occlusal surface of the third molar was exposed through the gum tissue, and no radiogram was made of the condition. The patient was anesthetized, but the operator, when beginning the operation, encountered unusual resistance. The various operative procedures

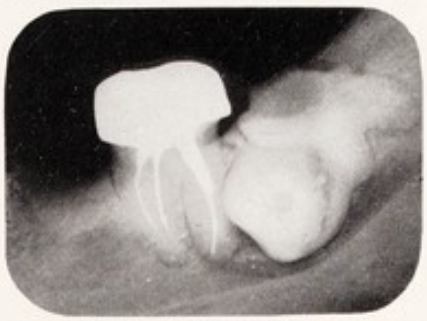


Fig. 246. — Fourth Molar Fused with Third Molar. Attempted extraction without previously making a radiogram. After failure to extract tooth a radiogram was made, which showed roots of a fourth molar fused with third.

indicated in such a case were applied, but it was impossible to extract the tooth. The operator, concluding that an extreme abnormality was causing the interference, made a radiogram of the case, which revealed the condition shown in the illustration. The third molar roots were fused into a solid mass with a fourth molar, which indicated an entirely different procedure from the one that had been attempted, emphasizing the advisability of making a radiogram of every mandibular third molar when extraction is contemplated. If a radiogram had been made previous to the attempted operation, the operator would have instituted the procedure that the condition indicated, and would have extracted the tooth without the unpleasant experience that was associated with the case.

A B

Fig. 247. — Fourth Molar Roots Fused with Third Molar. *A*, roots of fourth molar fused with third, with caries involving latter tooth; *B*, complete fusion of roots of fourth molar with third, but latter tooth not affected by caries.

In Fig. 247 are shown two radiograms of a fourth molar. In Fig. 247 A is shown the fourth molar fused with the third, with caries involving the latter tooth, and in Fig. 247 B the third molar is not affected by caries, but there is a complete fusion with the fourth molar. This condition is not usually associated with the mandibular third molar, but is frequently found in connection with the maxillary third molar, where a fusion of the second and third molars may occur,

Fig. 248. — Impacted Third and Fourth Molars. In addition to impacted third molar, there is an impacted fourth.

and where occasionally there is a fusion of the third molar with the fourth. Where either of these abnormalities occur, the operator should determine from the radiogram the extent of excision of the ossistructure that may be indicated and decide the extraction movements that can be executed in conformity with the root formation. The tooth can be extracted in its entirety by careful excision of the ossistructure and proper exolever technic.

In Fig. 248 is shown, in addition to the impacted third molar, an impacted fourth molar that is not fused with the third.

CHAPTER XIII

Checking the Lingual Radiogram With the Occlusal Radiogram

WHERE a lingual radiogram has been made of a case and the diagnostic points presented have been interpreted, but the operator desires to determine the alignment of the third molar, as well as any deflection that may be present, as shown in the lingual radiogram, an occlusal radiogram is made according to the method described on page 21. The occlusal radiogram, however, will not define many of the diagnostic points that may be obtained in a lingual radiogram, such as the supporting ossistructure, the pathologic changes of the ossistructure that may be below the mesial surface, the character of the root formation and similar points. An occlusal radiogram is only a means of obtaining additional information for checking the alignment of the third molar with the second and ascertaining the extent of any deflection of the tooth. In some cases the occlusal radiogram will also aid in determining the character of the ossistructure on the buccal and lingual surfaces and the extent to which they may be involved by a pathologic condition.

Where the crown of the third molar is not in contact with the second, the size of the space between these two teeth can often be determined by an occlusal radiogram. Where, however, there is such a contact, it will be shown in the occlusal radiogram, but its exact location cannot be determined, as no clear definition of the prevailing condition can be obtained.

The clinical findings of the alignment of the first molar with the second should always be checked in the occlusal radiogram to determine their accuracy, as the radiogram should show the same position of the occlusal surface as is determined by the clinical findings.

Where there is an approximately normal alignment of the first and second molars, the contact of these two teeth should be shown as clearly in an occlusal as in a lingual radiogram, and no overlap should be visible. Where the first and second molars are in alignment, an occlusal radiogram will not show either a buccal or a lingual aspect of the roots of these two teeth, as they will be superimposed respectively upon the crowns. There will be an exception to this condition where there is a decided lingual inclination of either the first or second molar, in which case the second molar will usually show a foreshortening of the roots on the buccal surface, and this condition will also be

revealed by a clinical examination. If there is a mesial inclination of the second molar, a correct occlusal radiogram cannot be made, as the roots of the second molar will cast a shadow upon the mesial surface of the third molar, rendering it difficult to make a correct diagnosis of the third molar.

All diagnostic points regarding the ossistructure on the distal surface of the third molar that are shown in a lingual radiogram will be lost in an occlusal radiogram, as the distal end of the film will curve upward in the latter radiogram, following the angle of the ramus.

In some vertical and distoangular impactions an occlusal radiogram will show the apical third of the roots of the second molar in the space between the second and third molars, which will cast a shadow upon the third molar, but it will be less dense than the shadow of the crown in a lingual radiogram.

In a distoangular impaction an occlusal radiogram will show the crown of the third molar as a blurred shadow, especially on the distal surface, on account of the upward curve of the distal end of the film. Where the tooth is deflected lingually, the alignment of the buccal surface cannot be definitely determined on account of the roots casting a shadow upon the crown.

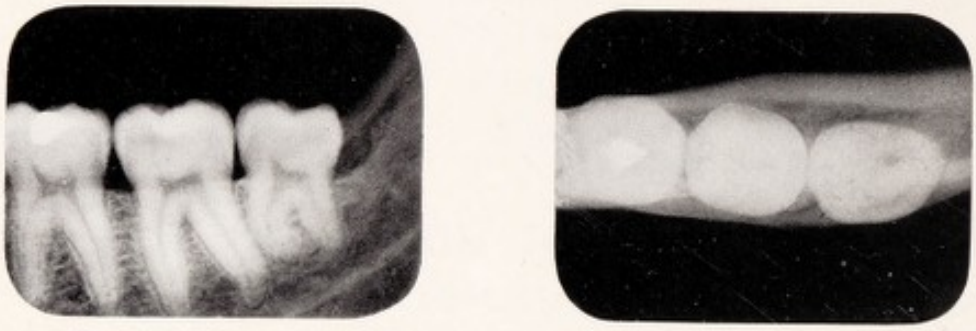
VERTICAL IMPACTION

Where the third molar is impacted in a vertical position, the comparative alignments to be determined from the lingual and occlusal radiograms are as follows: (1) the alignment of the buccal and lingual surfaces of the third molar in a case where there is no deflection with the corresponding surfaces of the second molar; (2) the alignment of the third molar where a part of the crown is deflected buccally out of alignment with the distobuccal surface of the second molar; (3) the alignment of the third molar where its occlusal and buccal surfaces are deflected to a slight extent lingually out of alignment with the buccal surface of the second molar; (4) the alignment of the third molar where its occlusal surface is deflected lingually and the mesiobuccal surface is out of alignment buccally with the distobuccal surface of the second molar, and there is a contact of the mesiobuccal surface of the third molar with the distobuccal surface of the second, and (5) the alignment of the surfaces that would normally be the buccal and lingual surfaces of the third molar, when the tooth is in a torsional position, with the corresponding surfaces of the second molar.

No Deflection, with the Mesial Surface Accessible.—In Fig. 249 are shown two radiograms of a vertical impaction, with no deflection and with the mesial surface accessible, where Fig. 249 A is a lingual view and Fig. 249 B is an occlusal view of the same case.

In Fig. 249 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar is involved by a pathologic condition (with a solid ledge of ossistructure on the distolingual surface), and on the lingual and buccal surfaces it extends up to the gingival third.

In Fig. 249 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second, and the mesial surface of the third molar is of the same width as the distal surface of the second. The lingual surface is free of ossistructure, but on the buccal surface the ossistructure is very heavy.



A B

Fig. 249. — Vertical Impaction. Same case of vertical impaction where there is no deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

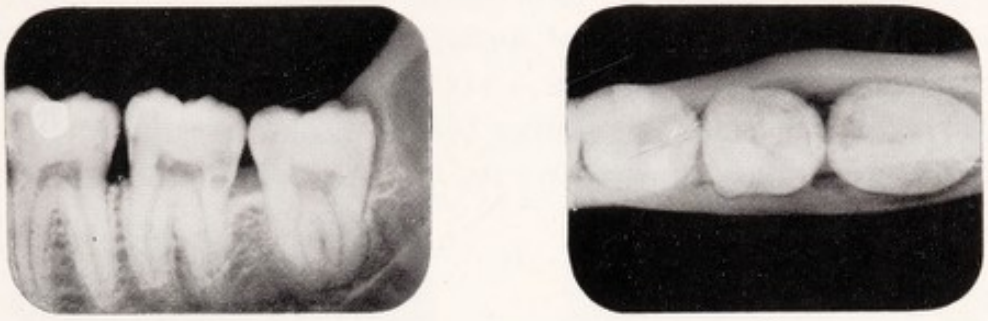
In Fig. 250 are shown two radiograms of a vertical impaction, with no deflection and with the mesial surface accessible, where Fig. 250 A is a lingual view and Fig. 250 B is an occlusal view of the same case.

In Fig. 250 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the occlusal surface and on the lingual and buccal surfaces beyond the gingival third.

In Fig. 250 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second. The ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface. The mesial surface of the third molar is wider than the distal surface of the second, and this condition

places a part of the mesial surface of the crown of the third molar out of alignment with the buccal surface of the second.

The technic for the extraction of the third molar in this type of impaction is like that described in a case of buccal deflection where the mesial surface is accessible (page 397), advantage being taken of that part of the mesial surface of the crown of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second for the application of the exolever, with the ossistructure anterior to this surface used as a fulcrum to avoid the use of the second molar for this purpose.

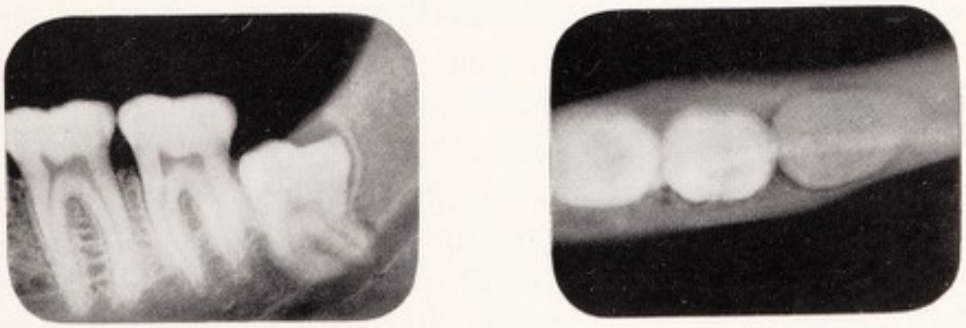


A B

Fig. 250. — Vertical Impaction. Same case of vertical impaction where there is no deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

No Deflection, with the Mesial Surface Inaccessible.—In Fig. 251 are shown two radiograms of a vertical impaction, with no deflection and with the mesial surface inaccessible, where Fig. 251 A is a lingual view and Fig. 251 B is an occlusal view of the same case.

In Fig. 251 A the occlusal surface of the third molar is quite a distance from the corresponding surface of the second, and there is no overlap of the mesial surface of the third molar upon the distal surface of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second.



A B

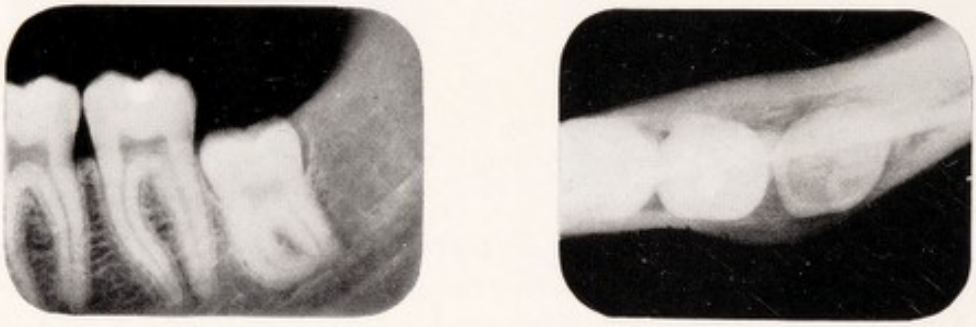
Fig. 251.—Vertical Impaction. Same case of vertical impaction where there is no deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

The ossistructure extends over the distoclusal surface of the third molar and on the entire mesial, distal, lingual and buccal surfaces.

In Fig. 251 B a slight shadow is cast upon the distal surface of the second molar by the distal root of the second molar, which is distal to the alignment of the distal surface of the second molar and the mesial surface of the third. The buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second. There is a greater amount of ossistructure on the lingual surface of the third molar than is usually seen in a vertical impaction, and the ossistructure is heavier on the buccal than on the lingual surface.

In Fig. 252 are shown two radiograms of a vertical impaction, with no deflection and with the mesial surface inaccessible, where Fig. 252 A is a lingual view and Fig. 252 B is an occlusal view of the same case.

In Fig. 252 A there is no overlap of the mesial surface of the third molar upon the distal root of the second molar, and there is a space



A B

Fig. 252. — Vertical Impaction. Same case of vertical impaction where there is no deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

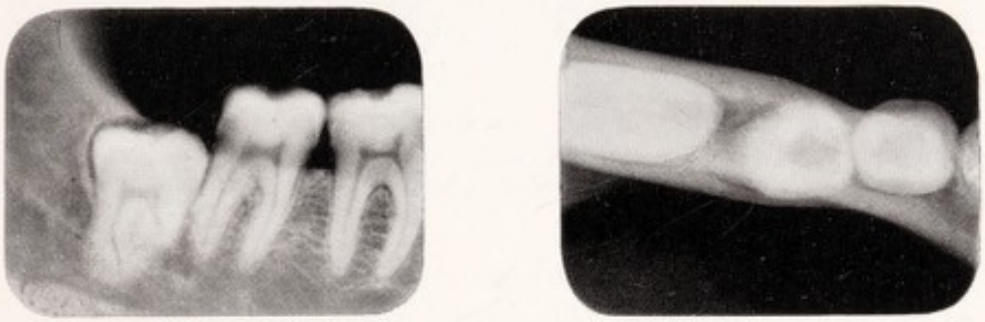
between the distal root of the second molar and the mesial surface of the third. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the occlusal surface (which is slightly involved by a pathologic condition), and on the entire mesial, distal, lingual and buccal surfaces. The interseptum between the distal root of the second molar and the mesial surface of the third is of medium size.

In Fig. 252 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second molar. The space between the distal root of the second molar and the mesial surface of the third molar is shown, although a shadow is cast upon the crown of the third molar by the distal root of the second. No positive definition can be obtained of the ossistructure on the buccal

or lingual surface of the third molar on account of the upward curve of the distal end of the film.

In Fig. 253 are shown two radiograms of a vertical impaction, with no deflection and with the mesial surface inaccessible, where Fig. 253 A is a lingual view and Fig. 253 B is an occlusal view of the same case.

In Fig. 253 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second molar, and there is a slight space between the distal root of the second molar and the mesial surface of the third. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure extends over the distoclusal surface of the third molar, and on the entire distal, lingual and buccal surfaces. The superior



A B

Fig. 253.—Vertical Impaction. Same case of vertical impaction where there is no deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

border of the ossistructure extends up to the occlusal surface and the mesial surface of the third molar is inaccessible, but the amount of ossistructure on the mesial surface cannot be definitely determined.

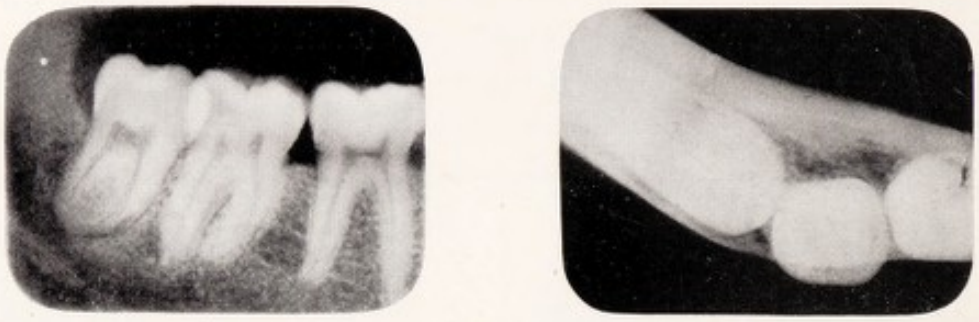
In Fig. 253 B a part of the distal root of the second molar is shown because of the mesial inclination of this tooth, and the alignment of the buccal and lingual surfaces of the third molar with the corresponding surfaces of the second molar cannot be definitely determined.

Buccal Deflection, with the Mesial Surface Accessible.—In Fig. 254 are shown two radiograms of a vertical impaction, with a buccal deflection and with the mesial surface accessible, where Fig. 254 A is a lingual view and Fig. 254 B is an occlusal view of the same case.

In Fig. 254 A there is an overlap of the mesial surface of the third molar upon the distal surface of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the

first molar upon the second. The ossistructure on the distal surface of the third molar is involved by a pathologic condition and does not extend beyond the gingival third on the buccal and lingual surfaces.

In Fig. 254 B the buccal surface of the crown of the third molar is deflected buccally out of alignment with the corresponding surface of the second molar, and a part of the mesial surface of the crown of the third molar is deflected buccally out of alignment with the disto-buccal surface of the second molar. The ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface.



A B

Fig. 254. — Vertical Impaction. Same case of vertical impaction where there is a buccal deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

In Fig. 255 are shown two radiograms of a vertical impaction, with a buccal deflection and with the mesial surface accessible, where Fig. 255 A is a lingual view and Fig. 255 B is an occlusal view of the same case.

In Fig. 255 A there is an overlap of the mesial surface of the third molar upon the distal surface of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the

A B

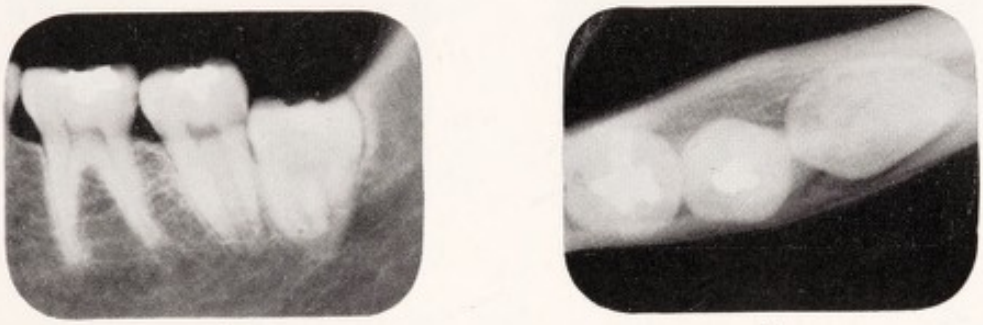
Fig. 255. — Vertical Impaction. Same case of vertical impaction where there is a buccal deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

third molar extends up to the occlusal surface and on the greater part of the lingual and buccal surfaces.

In Fig. 255 B the buccal surface of the crown of the third molar is deflected buccally out of alignment with the corresponding surface of the second molar. A part of the mesial surface of the crown of the third molar is deflected buccally out of alignment with the distobuccal surface of the second molar. The ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface.

In Fig. 256 are shown two radiograms of a vertical impaction, with a buccal deflection and with the mesial surface accessible, where Fig. 256 A is a lingual view and Fig. 256 B is an occlusal view of the same case.

In Fig. 256 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second, and the occlusal surface of the third molar is quite a distance from the corresponding surface of



A B

Fig. 256. — Vertical Impaction. Same case of vertical impaction where there is a buccal deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. There is a slight mesial inclination of the second molar, which prevents a contact of the mesial surface of the third molar with the distal surface of the second, which will prevent a shadow from being cast that would show a buccal deflection. The ossistructure on the distal surface of the third molar extends up to the occlusal surface, and on the greater part of the lingual and buccal surfaces.

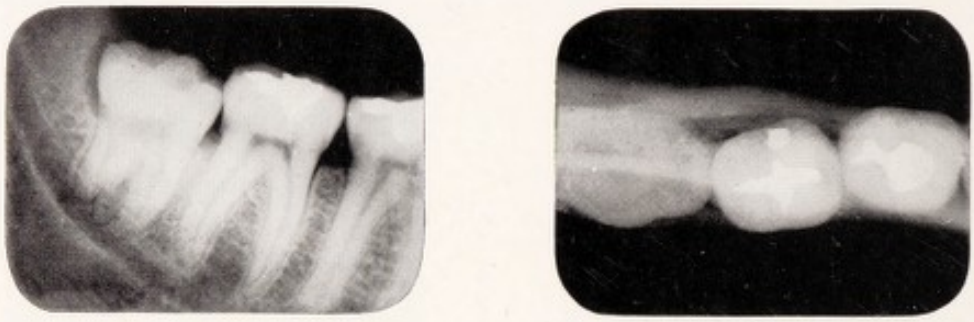
In Fig. 256 B the buccal and lingual surfaces of the third molar are out of alignment buccally with the corresponding surfaces of the second molar. On account of the mesial inclination of the second molar, the shadow of the distal root of this tooth is cast upon the crown of the third molar, and no positive definition can be obtained of the ossi-

structure on the buccal or lingual surface. The crown is blurred on account of the upward curve of the distal end of the film.

This is a type of impaction where the lingual radiogram will make it appear that there is no deflection, but the occlusal radiogram will show a buccal deflection.

Lingual Deflection, with the Mesial Surface Accessible.—In Fig. 257 are shown two radiograms of a vertical impaction, with a lingual deflection and with the mesial surface accessible, where Fig. 257 A is a lingual view and Fig. 257 B is an occlusal view of the same case.

In Fig. 257 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second, and a part of the occlusal surface of the third molar is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the con-



A B

Fig. 257. — Vertical Impaction. Same case of vertical impaction where there is a lingual deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

tact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the occlusal surface (which is slightly involved by a pathologic condition), and on the buccal and lingual surfaces slightly beyond the gingival third.

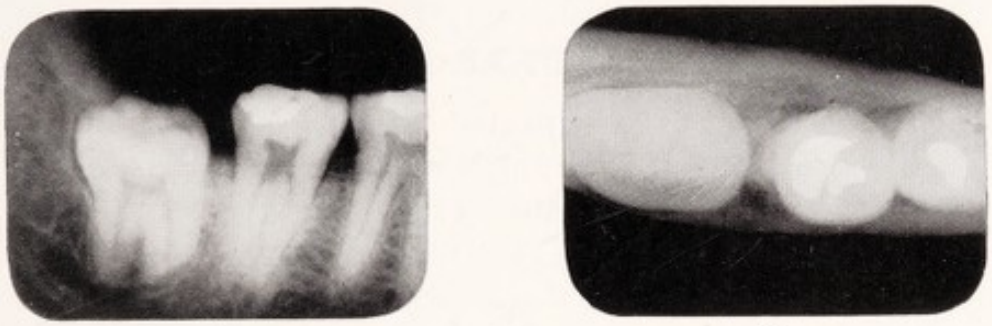
In Fig. 257 B the alignment of the buccal surface of the third molar, on account of the lingual inclination of the tooth, cannot be definitely determined, as a shadow is cast upon this surface by the roots, and the alignment cannot be determined as in a case where the crown is in alignment or is deflected buccally. No positive definition can be obtained of the ossistructure on the buccal and lingual surfaces of the third molar on account of the character of the deflection.

In Fig. 258 are shown two radiograms of a vertical impaction, with a lingual deflection and with the mesial surface accessible, where Fig. 258 A is a lingual view and Fig. 258 B is an occlusal view of the same case.

In Fig. 258 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second, and a part of the occlusal surface of the third molar is visible. The first and second molars show

definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends over the occlusal surface and on the greater part of the lingual and buccal surfaces. There is a large interseptum between the distal root of the second molar and the mesial root of the third.

In Fig. 258 B the alignment of the buccal surface of the third molar cannot be compared with the corresponding surface of the second molar, as the shadow of the roots cast upon this surface produces a blurred effect. The space between the second and third molars and a part of the distal root of the second molar are shown. No positive definition can be obtained of the ossistructure on the buccal or lingual surface of the third molar.

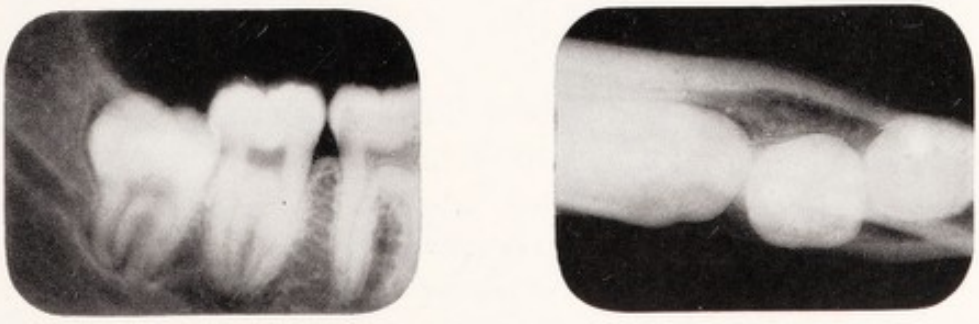


A B

Fig. 258. — Vertical Impaction. Same case of vertical impaction where there is a lingual deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

Buccolingual Deflection, with the Mesial Surface Accessible.—In Fig. 259 are shown two radiograms of a vertical impaction, with a buccolingual deflection and with the mesial surface accessible, where Fig. 259 A is a lingual view and Fig. 259 B is an occlusal view of the same case.

In Fig. 259 A there is a slight overlap of the mesioclusal surface of the third molar upon the distobuccal surface of the second, and a



A B

Fig. 259.—Vertical Impaction. Same case of vertical impaction where there is a buccolingual deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

part of the occlusal surface of the third molar is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure extends slightly over the distoclusal surface of the third molar, on the entire distal surface and on the greater part of the lingual and buccal surfaces.

In Fig. 259 B the mesiobuccal surface of the crown of the third molar is slightly out of alignment buccally with the distobuccal surface of the second molar. There is a slight contact of the mesiobuccal surface of the third molar with the distobuccal surface of the second. The lingual deflection of the third molar cannot be determined in an occlusal radiogram, as the shadow of the roots is cast upon the buccal surface. The ossistructure on the lingual surface is thin compared with that on the buccal surface.

MESIOANGULAR IMPACTION

Where the third molar is impacted in a mesioangular position, the comparative alignments to be determined from the lingual and occlusal radiograms are as follows: (1) the alignment of the buccal and lingual surfaces of the third molar in a case where there is no deflection with the corresponding surfaces of the second molar; (2) the alignment of the third molar where a part of the crown is deflected buccally out of alignment with the buccal surface of the second molar; (3) the alignment of the third molar where its occlusal and buccal surfaces are deflected to a slight extent lingually out of alignment with the buccal surface of the second molar; (4) the alignment of the third molar where its occlusal surface is deflected lingually, and a part of the mesioclusal surface is in contact with the distobuccal surface of the second molar, with the buccal surface of the crown of the third molar deflected buccally out of alignment with the corresponding surface of the second molar, and (5) the alignment of the surfaces that would normally be the buccal and lingual surfaces of the third molar, when the tooth is in a torsional position, with the corresponding surfaces of the second molar.

No Deflection, with the Mesial Surface Accessible.—In Fig. 260 are shown two radiograms of a mesioangular impaction, with no deflection and with the mesial surface accessible, where Fig. 260 A is a lingual view and Fig. 260 B is an occlusal view of the same case.

In Fig. 260 A there is no overlap of the occlusal or mesial surface of the third molar upon the distal surface of the second, and no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal sur-

faces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the gingival third, and the lingual and buccal surfaces are free of ossistructure at the gingival third. The ossistructure on the mesial surface is slightly involved by a pathologic condition.

In Fig. 260 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second molar. There is no ossistructure on the lingual surface of the third molar, and the ossistructure on the buccal surface is not very heavy. There is a small space between the mesiobuccal surface and the ossistructure on this surface.

A B

Fig. 260. — Mesioangular Impaction. Same case of mesioangular impaction where there is no deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

In Fig. 261 are shown two radiograms of a mesioangular impaction, with no deflection and with the mesial surface accessible, where Fig. 261 A is a lingual view and Fig. 261 B is an occlusal view of the same case.

In Fig. 261 A there is no overlap of the occlusal or mesial surface of the third molar upon the distal surface of the second, and no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the con-

A B

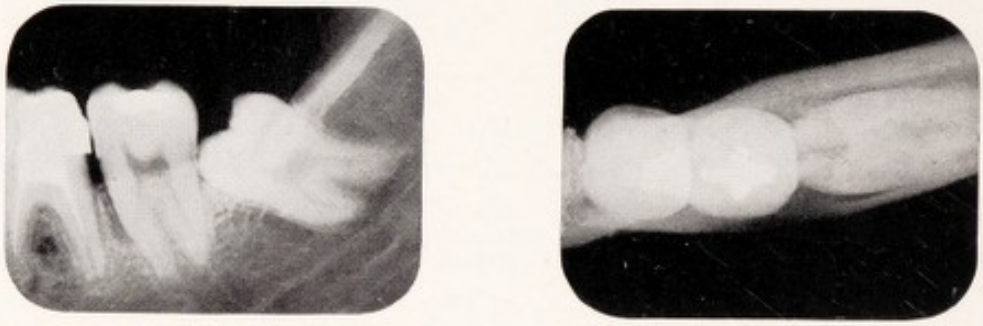
Fig. 261. — Mesioangular Impaction. Same case of mesioangular impaction where there is no deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

tact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends slightly beyond the gingival third, and the lingual and buccal surfaces are free of ossistructure at the gingival third. The ossistructure on the mesial surface is slightly involved by a pathologic condition.

In Fig. 261 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second molar. The ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface.

In Fig. 262 are shown two radiograms of a mesioangular impaction, with no deflection and with the mesial surface accessible, where Fig. 262 A is a lingual view and Fig. 262 B is an occlusal view of the same case.

In Fig. 262 A there is no overlap of the occlusal or mesial surface of the third molar upon the distal surface of the second, and no part of



A B

Fig. 262. — Mesioangular Impaction. Same case of mesioangular impaction where there is no deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

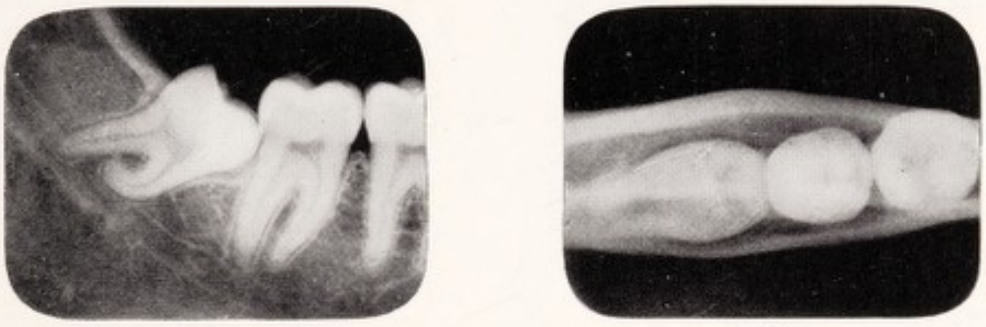
the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the gingival third, and on the lingual and buccal surfaces slightly beyond the gingival third. The ossistructure on the mesial surface is not involved by a pathologic condition, and there is only a slight space between this surface and the distal surface of the second molar.

In Fig. 262 B the buccal surface of the third molar is in alignment with the corresponding surface of the second molar. The lingual surface of the third molar is deflected to a slight extent lingually out of alignment with the corresponding surface of the second molar owing to the fact that the crown of the third molar is smaller than the crown of the second. The ossistructure on the lingual surface of the third molar is thin compared with that on the buccal surface.

No Deflection, with the Mesial Surface Inaccessible.—In Fig. 263 are shown two radiograms of a mesioangular impaction, with no deflection and with the mesial surface inaccessible, where Fig. 263 A is a lingual view and Fig. 263 B is an occlusal view of the same case.

In Fig. 263 A there is no overlap of the occlusal or mesial surface of the third molar upon the distobuccal surface of the second, and no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends slightly beyond the gingival third, on the entire mesial surface and on the greater part of the lingual and buccal surfaces.

In Fig. 263 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second molar.



A B

Fig. 263. — Mesioangular Impaction. Same case of mesioangular impaction where there is no deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

The ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface. There is a space between the buccal surface, and the ossistructure on this surface, and the same condition exists on the lingual surface.

In Fig. 264 are shown two radiograms of a mesioangular impaction, with no deflection and with the mesial surface inaccessible, where Fig. 264 A is a lingual view and Fig. 264 B is an occlusal view of the same case.

In Fig. 264 A there is no overlap of the occlusal or mesial surface of the third molar upon the distal root of the second, and no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the occlusal surface, and on the entire mesial, lingual and buccal surfaces. The septum at

the bifurcation of the roots of the second molar is slightly involved by a pathologic condition.

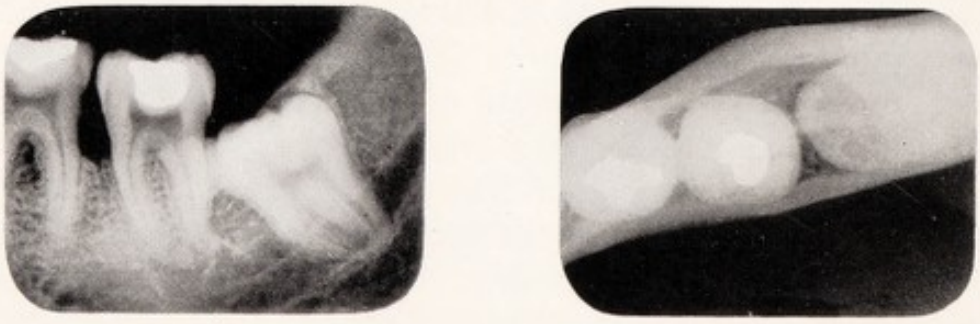
In Fig. 264 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second. The distal root of the second molar casts a shadow upon the crown of the third. The ossistructure on the lingual surface is thin compared with that on the buccal surface. There is a small space between the mesiobuccal surface and the ossistructure on this surface.

In Fig. 265 are shown two radiograms of a mesioangular impaction, with no deflection and with the mesial surface inaccessible, where Fig. 265 A is a lingual view and Fig. 265 B is an occlusal view of the same case.

A B

Fig. 264. — Mesioangular Impaction. Same case of mesioangular impaction where there is no deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

In Fig. 265 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second, and no part of the occlusal surface of the third molar is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure extends over the distoclusal surface of the third molar and on the entire mesial, distal. lingual and buccal surfaces. There is quite a large interseptum between the distal root of the second molar and the mesial surface of the third.



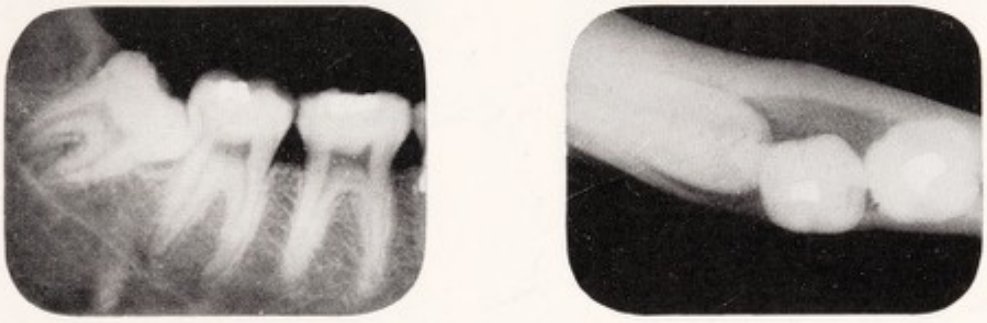
A B

Fig. 265. — Mesioangular Impaction. Same case of mesioangular impaction where there is no deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

In Fig. 265 B the buccal and lingual surfaces of the crown of the third molar are slightly out of alignment buccally with the corresponding surfaces of the second, and this condition may be caused by the upward curve of the distal end of the film. A space is shown between the second and third molars. The ossistructure on the lingual surface of the third molar is thin compared with that on the buccal surface.

Buccal Deflection, with the Mesial Surface Accessible.—In Fig. 266 are shown two radiograms of a mesioangular impaction, with a buccal deflection and with the mesial surface accessible, where Fig. 266 A is a lingual view and Fig. 266 B is an occlusal view of the same case.

In Fig. 266 A there is an overlap of a part of the occlusal surface of the third molar upon the distobuccal surface of the second, and no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of the two teeth is visible. There is no overlap, at the contact



A B

Fig. 266. — Mesioangular Impaction. Same case of mesioangular impaction where there is a buccal deflection with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

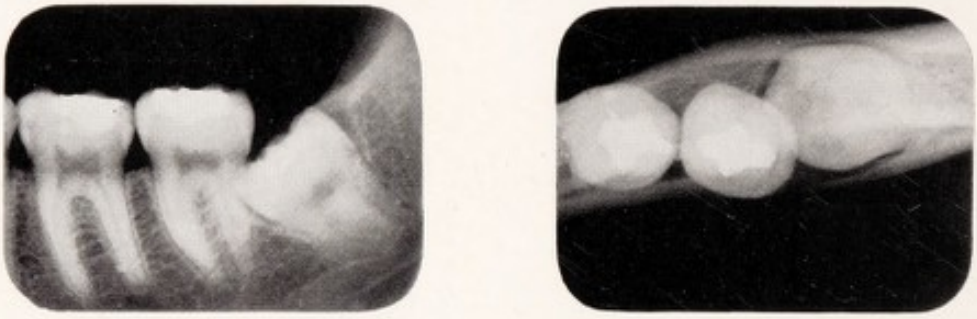
point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the occlusal surface (which is slightly involved by a pathologic condition), and on the greater part of the lingual and buccal surfaces.

In Fig. 266 B the buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second molar. A comparison should be made of the alignment of the lingual surface of the third molar with the corresponding surface of the second. The extent to which part of the mesial surface of the crown of the third molar is deflected buccally out of alignment with the distobuccal surface of the second molar is shown. The ossistructure on the lingual surface of the third molar is thin compared with that on the buccal surface.

Buccal Deflection, with the Mesial Surface Inaccessible.—In Fig. 267 are shown two radiograms of a mesioangular impaction, with a buccal deflection and with the mesial surface inaccessible, where Fig.

267 A is a lingual view and Fig. 267 B is an occlusal view of the same case.

In Fig. 267 A the location of the superior border of the ossistructure indicates that the mesial surface is inaccessible, as this surface is below the superior border and no dependence can be placed on the involved area for access. There is an overlap of the mesioclusal surface of the third molar upon the distobuccal surface of the second, and no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the occlusal surface (which is slightly involved by a pathologic condition) and on the entire buccal and lingual surfaces.



A B

Fig. 267. — Mesioangular Impaction. Same case of mesioangular impaction where there is a buccal deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

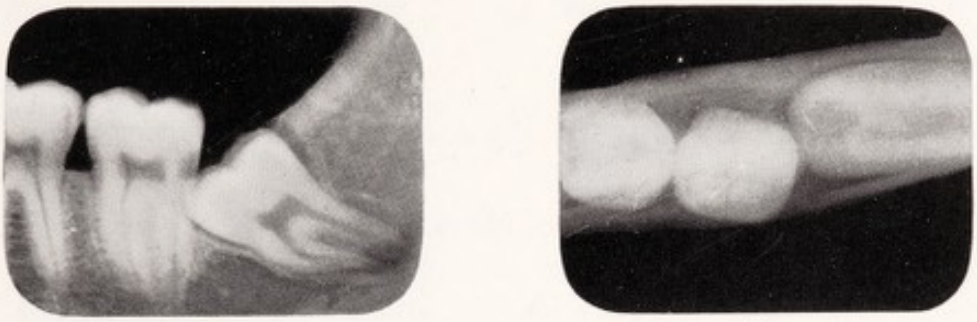
In Fig. 267 B a slight area along the mesial surface is involved by a pathologic condition. The buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second molar. The extent to which part of the mesial surface of the crown of the third molar is deflected buccally out of alignment with the distobuccal surface of the second molar is shown. The ossistructure on the lingual surface is very thin compared with that on the buccal surface.

In Fig. 268 are shown two radiograms of a mesioangular impaction, with a buccal deflection and with the mesial surface inaccessible, where Fig. 268 A is a lingual view and Fig. 268 B is an occlusal view of the same case.

In Fig. 268 A there is a slight overlap of the mesioclusal surface of the third molar upon the distal root of the second, and no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on

the distal surface of the third molar extends up to the occlusal surface (which is slightly involved by a pathologic condition) and on the entire mesial, lingual and buccal surfaces.

In Fig. 268 B the buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second molar. A comparison should be made of the alignment of the lingual surface of the third molar with the corresponding surface of the second molar. The extent to which part of the mesial surface of the crown of the third molar is deflected buccally out of alignment with the buccal surface of the second molar is shown. The ossistructure on the buccal surface of the third molar is thin, and a space is shown between the lingual surface and the ossistructure on this surface. The ossistructure on the buccal surface is not so heavy as is usually seen in a case where there is no deflection.



A B

Fig. 268.—Mesioangular Impaction. Same case of mesioangular impaction where there is a buccal deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

In Fig. 269 are shown two radiograms of a mesioangular impaction, with a buccal deflection and with the mesial surface inaccessible, where Fig. 269 A is a lingual view and Fig. 269 B is an occlusal view of the same case.

In Fig. 269 A the mesial surface of the third molar is in close contact with the gingival third of the second molar. There is no overlap or shadow cast upon the distal root of the second molar, which condition, if present, would indicate a buccal deflection. This is the type of a case to which attention is directed in the description of a buccal deflection where no positive definition of a buccal deflection can be determined unless an occlusal radiogram has been made. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the occlusal surface (which is slightly involved by a pathologic condition) and on the entire mesial, lingual and buccal surfaces.

In Fig. 269 B the buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second molar. The extent to which part of the mesial surface of the crown of the third molar is deflected buccally out of alignment with the distobuccal surface of the second molar is shown. The ossistructure on the lingual surface of the third molar is slightly heavier than is usually seen in a buccal deflection, but is not so heavy as is seen on the buccal surface in a case where there is no deflection.

A B

Fig. 269. — Mesioangular Impaction. Same case of mesioangular impaction where there is a buccal deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

Lingual Deflection, with the Mesial Surface Accessible.—In Fig. 270 are shown two radiograms of a mesioangular impaction, with a slight lingual deflection and with the mesial surface accessible, where Fig. 270 A is a lingual view and Fig. 270 B is an occlusal view of the same case.

In Fig. 270 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second, and a part of the occlusal surface of the third molar is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure is extensively involved by a pathologic condition on the mesial, distal, lingual and buccal surfaces of the third molar.

A B

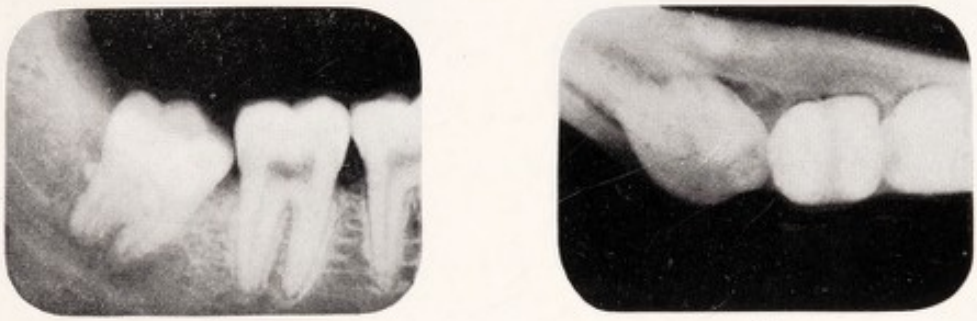
Fig. 270. — Mesioangular Impaction. Same case of mesioangular impaction where there is a lingual deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

In Fig. 270 B the buccal and lingual surfaces of the third molar are slightly out of alignment lingually with the corresponding surfaces of the second molar. The ossistructure on the lingual surface of the third molar is thin compared with that on the buccal surface.

In Fig. 271 are shown two radiograms of a mesioangular impaction, with a lingual deflection and with the mesial surface accessible, where Fig. 271 A is a lingual view and Fig. 271 B is an occlusal view of the same case.

In Fig. 271 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second, and a part of the occlusal surface of the third molar is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible.

There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar



A B

Fig. 271. — Mesioangular Impaction. Same case of mesioangular impaction where there is a lingual deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

extends slightly beyond the gingival third, but does not extend very far beyond the gingival third on the lingual and buccal surfaces, and is slightly involved by a pathologic condition anterior to the mesial surface.

In Fig. 271 B no definition can be obtained of the alignment of the buccal surface of the third molar on account of the shadow of the roots cast upon this surface. The relation of the mesial surface of the third molar to the distal surface of the second molar is shown. The lingual alignment of the occlusal surface of the third molar should be compared with the alignment of the lingual surface of the second molar. No positive definition can be obtained of the ossistructure on the lingual surface of the third molar on account of the lingual deflection of the tooth, and for the same reason no positive definition can be obtained of the ossistructure on the buccal surface.

In Fig. 272 are shown two radiograms of a mesioangular impaction, with a lingual deflection and with the mesial surface accessible; where

Fig. 272 A is a lingual view and Fig. 272 B is an occlusal view of the same case.

In Fig. 272 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second, and a part of the occlusal surface of the third molar is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the occlusal surface (which is slightly involved by a pathologic condition) and on the greater part of the lingual and buccal surfaces.

In Fig. 272 B no positive definition can be obtained of the alignment of the buccal surface of the crown of the third molar on account of the shadow of the roots cast upon this surface. The relation of the mesial surface of the third molar to the distal surface of the second

A B

Fig. 272.—Mesioangular Impaction. Same case of mesioangular impaction where there is a lingual deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

molar, as shown in the radiogram, is not dependable for the operative procedure on account of the deflection of the tooth. The lingual alignment of the occlusal surface of the third molar should be compared with the alignment of the lingual surface of the second molar. No definition can be obtained of the ossistructure on the lingual surface of the third molar on account of the lingual deflection of the tooth, and for the same reason no definition can be obtained of the ossistructure on the buccal surface.

Lingual Deflection, with the Mesial Surface Inaccessible.—In Fig. 273 are shown two radiograms of a mesioangular impaction, with a lingual deflection and with the mesial surface inaccessible, where Fig. 273 A is a lingual view and Fig. 273 B is an occlusal view of the same case.

In Fig. 273 A there is no overlap of the occlusal surface upon the distal surface of the distal root of the second molar, and a part of the occlusal surface is visible. The first and second molars show definite

enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure extends entirely over the third molar.

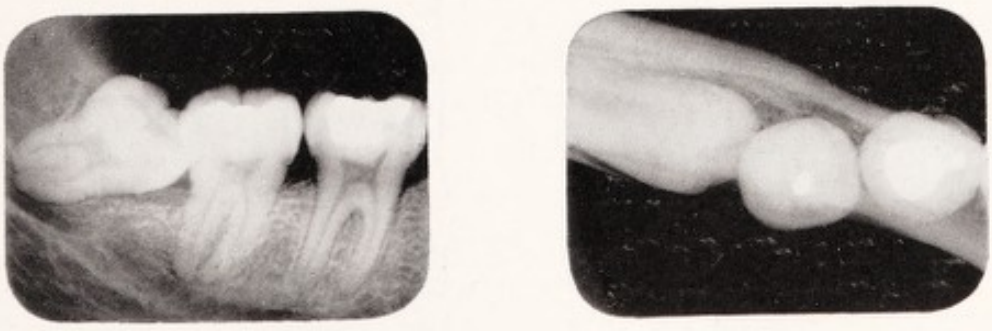
In Fig. 273 B no positive definition can be obtained of the alignment of the buccal surface of the crown of the third molar on account of the shadow of the roots cast upon this surface. The middle third of the distal root of the second molar is visible owing to a slight mesial inclination of the latter tooth. No positive definition can be obtained of the ossistructure on the buccal or lingual surface of the third molar.

A B

Fig. 273. — Mesioangular Impaction. Same case of mesioangular impaction where there is a lingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

Buccolingual Deflection, with the Mesial Surface Accessible.—In Fig. 274 are shown two radiograms of a mesioangular impaction, with a buccolingual deflection and with the mesial surface accessible, where Fig. 274 A is a lingual view and Fig. 274 B is an occlusal view of the same case.

In Fig. 274 A there is an overlap of a part of the mesioclusal surface of the third molar upon the distobuccal surface of the second, and a part of the occlusal surface is visible. The first molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface of the tooth is visible. The second molar shows a slight lingual deflection indicated by a part of the occlusal surface being visible. There is no



A B

Fig. 274. — Mesioangular Impaction. Same case of mesioangular impaction where there is a buccolingual deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the occlusal surface and on the greater part of the lingual and buccal surfaces.

In Fig. 274 B the buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second. Part of the mesioclusal surface of the third molar is in contact with the distobuccal surface of the second. The occlusal surface of the third molar is visible, thus indicating a lingual inclination of the tooth. The special points to be observed are the relation of the mesioclusal surface of the third molar to the distobuccal surface of the second, and the extent to which part of the mesioclusal surface of the third molar is in contact with the distobuccal surface of the second. No positive definition can be obtained of the ossistructure on the buccal or lingual surface of the third molar on account of the shadow cast by the roots.

A B

Fig. 275. — Mesioangular Impaction. Same case of mesioangular impaction where there is a buccolingual deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

In Fig. 275 are shown two radiograms of a mesioangular impaction, with a buccolingual deflection and with the mesial surface accessible, where Fig. 275 A is a lingual view and Fig. 275 B is an occlusal view of the same case.

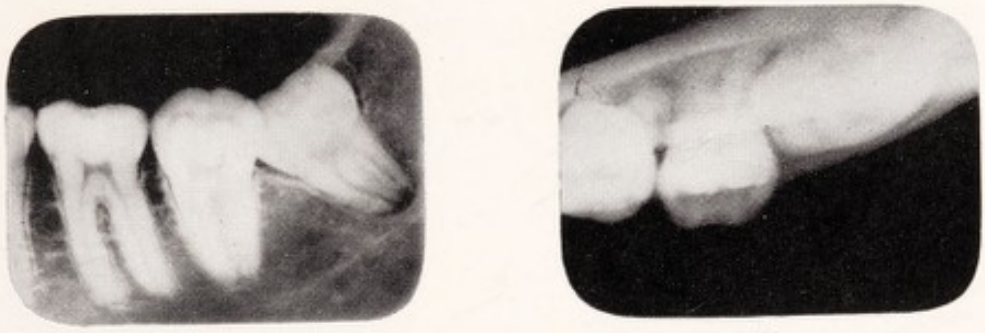
In Fig. 275 A there is an overlap of a part of the mesioclusal surface of the third molar upon the distobuccal surface of the second, and a part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the occlusal surface (which is slightly involved by a pathologic condition) and on the greater part of the lingual and buccal surfaces.

In Fig. 275 B the buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second. Part of the mesioclusal surface of the third molar is in contact with

the distobuccal surface of the second, and extends on the buccal surface of the second molar a short distance distal to the bifurcation of the latter tooth. The special points to be observed are the relation of the mesial surface of the third molar to the distobuccal surface of the second, and the extent to which part of the occlusal surface of the third molar is in contact with the distobuccal surface of the second. No positive definition can be obtained of the ossistructure on the buccal or lingual surface of the third molar on account of the shadow cast by the roots.

In Fig. 276 are shown two radiograms of a mesioangular impaction, with a buccolingual deflection and with the mesial surface accessible, where Fig. 276 A is a lingual view and Fig. 276 B is an occlusal view of the same case.

In Fig. 276 A there is an overlap of a part of the mesioclusal surface of the third molar upon the distobuccal surface of the second, and a



A B

Fig. 276. — Mesioangular Impaction. Same case of mesioangular impaction where there is a buccolingual deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

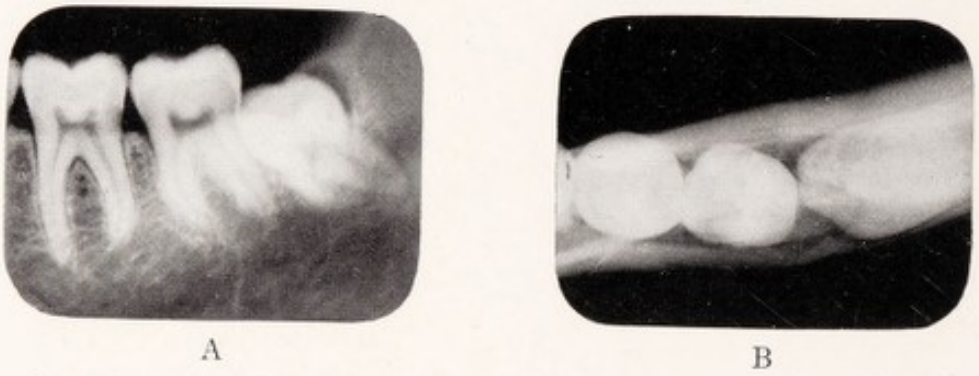
part of the occlusal surface is visible. The second molar, by showing a part of its occlusal surface, indicates a slight lingual inclination of the tooth, while the first molar shows no part of its occlusal surface, but a definite enamel cap and pulp chamber indicates no deflection. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the occlusal surface, and on the greater part of the lingual and buccal surfaces.

In Fig. 276 B no positive definition can be obtained of the alignment of the buccal and lingual surfaces of the third molar with the corresponding surfaces of the second on account of the marked lingual inclination of the latter tooth. The mesioclusal surface of the third molar appears to be in contact with the buccal surface of the distal root of the second, which is not the actual condition, as the lingual radiogram shows the mesioclusal surface of the third molar to be in contact with the distobuccal surface of the second. Where the second molar is

deflected lingually on account of the pressure of the third molar, and the mesioclusal surface of the latter tooth is in contact with the distobuccal surface of the second molar, no positive definition can be obtained of the ossistructure on the buccal or lingual surface of the third molar.

Buccolingual Deflection, with the Mesial Surface Inaccessible.—In Fig. 277 are shown two radiograms of a mesioangular impaction, with a buccolingual deflection and with the mesial surface inaccessible, where Fig. 277 A is a lingual view and Fig. 277 B is an occlusal view of the same case.

In Fig. 277 A there is an overlap of a part of the mesioclusal surface of the third molar upon the distobuccal surface of the second, and a part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the



A B

Fig. 277.— Mesioangular Impaction. Same case of mesioangular impaction where there is a buccolingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the occlusal surface (which is slightly involved by a pathologic condition), and on the entire mesial, lingual and buccal surfaces.

In Fig. 277 B the buccal surface of the crown of the third molar is slightly out of alignment buccally with the corresponding surface of the second. Part of the mesioclusal surface of the third molar is in contact with the distobuccal surface of the second. The ossistructure on the lingual surface, on account of the lingual inclination of the tooth, is not definitely outlined, and the ossistructure is heavier on the buccal than on the lingual surface.

In Fig. 278 are shown two radiograms of a mesioangular impaction, with a buccolingual deflection and with the mesial surface inaccessible, where Fig. 278 A is a lingual view and Fig. 278 B is an occlusal view of the same case.

In Fig. 278 A there is an overlap of a part of the mesioclusal surface

of the third molar upon the distobuccal surface of the second, and a part of the occlusal surface is visible. The first molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface of this tooth is visible. The second molar is deflected to a slight extent lingually, indicated by a part of the occlusal surface being visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends almost up to the occlusal surface, and on the entire mesial, lingual and buccal surfaces.

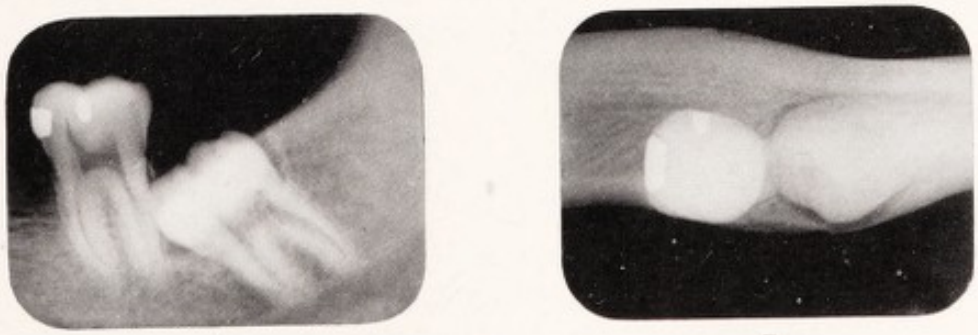
In Fig. 278 B the buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second molar. A part of the mesioclusal surface of the third molar is in contact with the distobuccal surface of the second. The ossistructure on the lingual surface of the third molar, on account of the lingual inclination of the tooth, is not definitely outlined, and the ossistructure is heavier on the buccal than on the lingual surface.

A B

Fig. 278. — Mesioangular Impaction. Same case of mesioangular impaction where there is a buccolingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

In Fig 279 are shown two radiograms of a mesioangular impaction, with a buccolingual deflection and with the mesial surface inaccessible, where Fig. 279 A is a lingual view and Fig. 279 B is an occlusal view of the same case.

In Fig. 279 A there is an overlap of a part of the mesioclusal surface

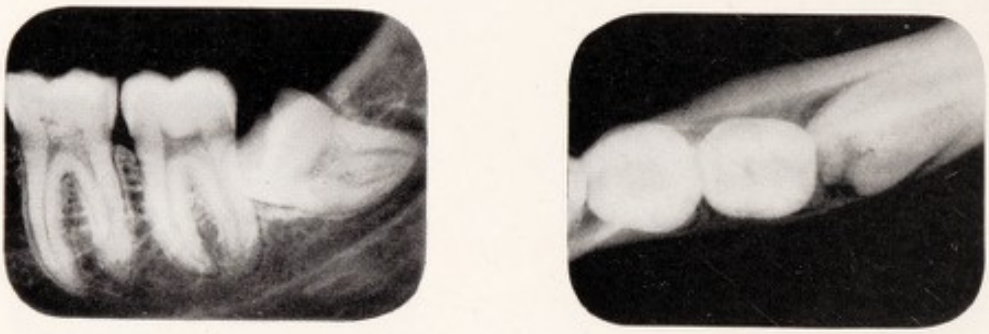


A B

Fig. 279. — Mesioangular Impaction. Same case of mesioangular impaction where there is a buccolingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

of the third molar upon the distal root of the second, and a part of the occlusal surface is visible. The second molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface of this tooth is visible. As there is no first molar present, the contact point between the first and second molars cannot be determined. The ossistructure on the distal surface of the third molar extends up to the occlusal surface (which is slightly involved by a pathologic condition), and on the entire mesial, lingual and buccal surfaces.

In Fig. 279 B the buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second. A part of the mesioclusal surface of the third molar is in contact with the distal root of the second, and a part of this root is visible. The lingual deflection of the occlusal surface of the third molar should be compared with the vertical alignments of the buccal and lingual surfaces of the second molar. The ossistructure on the lingual surface



A B

Fig. 280. — Mesioangular Impaction. Same case of mesioangular impaction where there is a buccolingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

of the third molar is thin compared with the ossistructure on the buccal surface.

In Fig. 280 are shown two radiograms of a mesioangular impaction, with a buccolingual deflection and with the mesial surface inaccessible, where Fig. 280 A is a lingual view and Fig. 280 B is an occlusal view of the same case.

In Fig. 280 A there is an overlap of a part of the mesioclusal surface of the third molar upon the distal root of the second, and a part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends slightly beyond the gingival third (which is slightly involved by a pathologic condition), on the entire mesial surface and on the greater part of the lingual and buccal surfaces.

In Fig. 280 B the buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second molar. A part of the mesioclusal surface of the third molar appears to be in contact with the distobuccal surface of the second molar, but no part of the roots of the latter tooth is visible, owing to the alignment of the distal surface of the second molar with the distal root from the occlusal surface of the third molar to the point of contact. The point of contact, as shown in the lingual radiogram, is below the gingival third of the second molar and not on the distobuccal surface. The lingual deflection of the occlusal surface of the third molar should be compared with the vertical alignments of the buccal and lingual surfaces of the second molar. There is a ledge of ossistructure between the occlusal surface of the third molar and the distal surface of the second, and there is a space between the buccal surface of the third molar and the ossistructure on this surface. The

A B

Fig. 281. — Mesioangular Impaction. Same case of mesioangular impaction where there is a buccolingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface.

In Fig. 281 are shown two radiograms of a mesioangular impaction, with a buccolingual deflection and with the mesial surface inaccessible, where Fig. 281 A is a lingual view and Fig 281 B is an occlusal view of the same case.

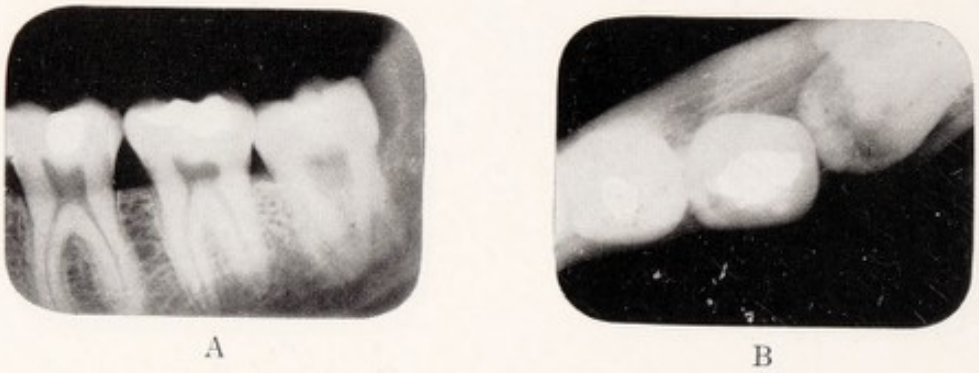
In Fig. 281 A there is an overlap of a part of the mesioclusal surface of the third molar upon the distobuccal surface of the second. The first molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface of the tooth is visible. The second molar shows a part of the occlusal surface, indicating a lingual deflection of the tooth. The ossistructure on the distal surface of the third molar extends to the occlusal surface, and on the entire mesial, lingual and buccal surfaces.

In Fig. 281 B the buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second. A part of the mesioclusal surface of the third molar is in contact with

the distobuccal surface at the gingival third of the second molar. The lingual deflection of the occlusal surface of the third molar should be compared with the distal surface of the second. The lingual deflection of the second molar is shown by a part of the roots which is visible on the buccal surface. There is a ledge of ossistructure between the linguoclusal surface of the third molar and the distal surface of the second, and there is a space between the buccal surface of the third molar and the ossistructure. The ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface.

Torsional Deflection, with the Surface that Would Normally be the Mesial Surface Accessible.—In Fig. 282 are shown two radiograms of a mesioangular impaction, with a torsional deflection and with the surface that would normally be the mesial accessible, where Fig. 282 A is a lingual view and Fig. 282 B is an occlusal view of the same case.

In Fig. 282 A there is an overlap of a part of the surface that would



A B

Fig. 282. — Mesioangular Impaction. Same case of mesioangular impaction, where there is a torsional deflection, with surface that would normally be mesial accessible. *A*, lingual view; *B*, occlusal view.

normally be the mesial surface of the third molar upon the distobuccal surface of the second. The indefinite arrangement of the cusps of the third molar and an indefinite pulp chamber, with the apparent presence of an extra root, indicate a torsional deflection. No positive definition can be obtained from a lingual radiogram of the alignment of the third molar with the second. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the surface that would normally be the distal surface of the third molar is extensively involved by a pathologic condition, and the surfaces that would normally be the lingual and buccal surfaces are free of ossistructure down to the gingival third.

In Fig. 282 B the surface that would normally be the buccal surface of the crown of the third molar is out of alignment at right angle buccally from the distobuccal surface of the second. A part of the

crown of the third molar is in contact with the distobuccal surface of the second molar, and no positive definition can be obtained of the ossistructure on the surface that would normally be the buccal or lingual surface of the third molar.

Torsional Deflection, with the Surface that Would Normally be Mesial Surface Inaccessible.—In Fig. 283 are shown two radiograms of a mesioangular impaction, with a torsional deflection and with the surface that would normally be the mesial surface inaccessible, where Fig. 283 A is a lingual view and Fig. 283 B is an occlusal view of the same case.

In Fig. 283 A there is no overlap of the occlusal surface of the third molar upon the distal root of the second. The indefinite arrangement of the cusps of the third molar and an indefinite pulp chamber, with the apparent presence of an extra root, indicate a torsional deflection. There is no overlap, at the contact point, of

A B

Fig. 283. — Mesioangular Impaction. Same case of mesioangular impaction, where there is a torsional deflection, with surface that would normally be mesial inaccessible. *A*, lingual view; *B*, occlusal view.

the first molar upon the second. The ossistructure on the surface that would normally be the distal surface of the third molar extends up to the occlusal surface, and on the surface that would normally be the entire mesial, lingual and buccal surfaces.

In Fig. 283 B the surface that would normally be the buccal surface of the crown of the third molar is out of alignment buccally with the buccal surface of the second, and that part of the surface that would normally be the mesial surface of the crown of the third molar is out of alignment buccally with the distobuccal surface of the second. The surface that would normally be the linguoclusal surface of the third molar is in contact with the buccal half of the distal surface of the second molar. No positive definition can be obtained of the ossistructure on the surface that would normally be the buccal surface of the third molar. On the surface that would normally be the lingual surface of the third molar is shown the extent to which the crown of this tooth is free from contact with the lingual half of the distal surface of the second

molar. This condition is a good example of the necessity of making an occlusal radiogram, especially in a case of torsional deflection where, in addition to this deflection, the tooth is deflected buccally.

DISTOANGULAR IMPACTION

Where the third molar is impacted in a distoangular position, the comparative alignments to be determined from the lingual and occlusal radiograms are as follows: (1) the alignment of the buccal and lingual surfaces of the third molar in a case where there is no deflection with the corresponding surfaces of the second molar; (2) the alignment of the third molar where a part of the crown is deflected buccally out of alignment with the distobuccal surface of the second molar; (3) the alignment of the crown of the third molar where its occlusal and buccal surfaces are deflected lingually to the buccal surface of the second molar, and (4) the alignment of

A B

Fig. 284. — Distoangular Impaction. Same case of distoangular impaction, where there is no deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

the surfaces that would normally be the buccal and lingual surfaces of the third molar, when the tooth is in a torsional position, with the lingual and buccal surfaces of the second.

No Deflection, with the Mesial Surface Accessible.—In Fig. 284 are shown two radiograms of a distoangular impaction, with no deflection and with the mesial surface accessible, where Fig. 284 A is a lingual view and Fig. 284 B is an occlusal view of the same case.

In Fig. 284 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure extends over the distoclusal surface of the third molar, on the entire distal surface (which is slightly involved by a pathologic condition), and on part of the lingual and buccal surfaces.

In Fig. 284 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second. The ossistructure on the lingual surface of the third molar is thin compared with that on the buccal surface.

In Fig. 285 are shown two radiograms of a distoangular impaction, with no deflection and with the mesial surface accessible, where Fig. 285 A is a lingual view and Fig. 285 B is an occlusal view of the same case.

In Fig. 285 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The mesial

A B

Fig. 285. — Distoangular Impaction. Same case of distoangular impaction, where there is no deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

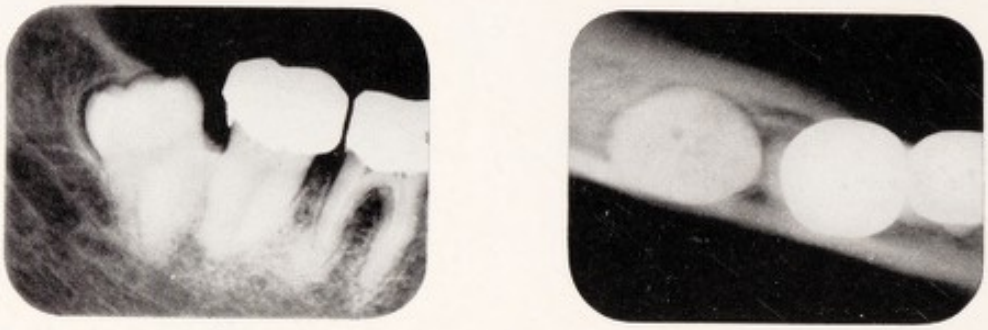
root of the third molar is in close contact with the distal root of the second. The ossistructure extends over the distal half of the occlusal surface of the third molar (which is slightly involved by a pathologic condition), on the entire distal surface (which is also slightly involved by a pathologic condition) and on the greater part of the lingual and buccal surfaces.

In Fig. 285 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second, and the mesial surface of the third molar is of the same width as the distal surface of the second. The ossistructure on the lingual surface of the third molar is thin compared with that on the buccal surface. The crown of the third molar is blurred on account of the upward curve of the distal end of the film.

In Fig. 286 are shown two radiograms of a distoangular impaction, with no deflection and with the mesial surface accessible, where Fig. 286 A is a lingual view and Fig. 286 B is an occlusal view of the same case.

In Fig. 286 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second, and there is quite a space between the mesial surface of the third molar and the distal surface of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure extends over the greater part of the occlusal surface, on the entire distal surface and on the greater part of the lingual and buccal surfaces of the third molar.

In Fig. 286 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second, with a part of the distal root of the second molar and the interproximal space



A B

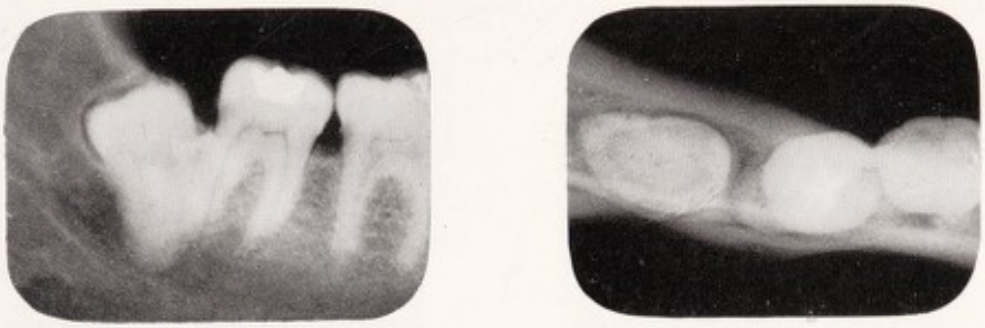
Fig. 286. — Distoangular Impaction. Same case of distoangular impaction, where there is no deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

between the second and third molars visible. No positive definition can be obtained of the ossistructure on the lingual or buccal surface.

In Fig. 287 are shown two radiograms of a distoangular impaction, with no deflection and with the mesial surface accessible, where Fig. 287 A is a lingual view and Fig. 287 B is an occlusal view of the same case.

In Fig. 287 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second, and there is quite a space between the mesial surface of the third molar and the distal surface of the second. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The mesial root of the third molar is in contact with the distal root of the second. The ossistructure extends over the entire occlusal surface, and on the entire distal, lingual and buccal surfaces of the third molar.

In Fig. 287 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second, with a part of the distal root of the second molar visible. There is a space between the distal root of the second molar and the mesial surface of the third, but no positive definition can be obtained of the space on account of the mesial inclination of the second molar and the distal inclination of the third. No positive definition can be obtained of the ossistructure on account of the upward curve of the distal end of the film.

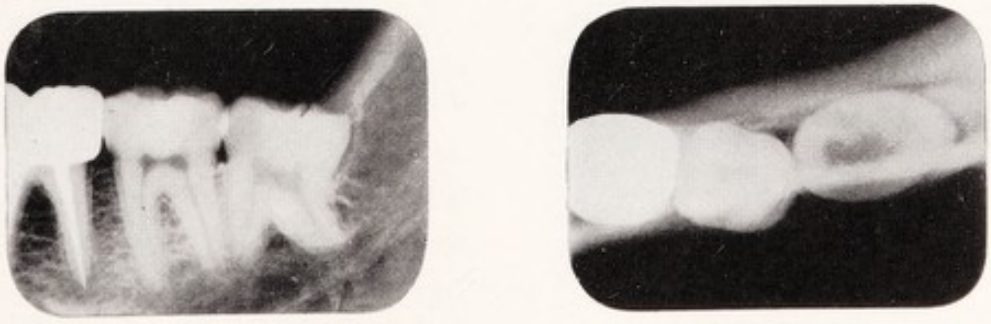


A B

Fig. 287. — Distoangular Impaction. Same case of distoangular impaction, where there is no deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

Buccal Deflection, with the Mesial Surface Accessible.—In Fig. 288 are shown two radiograms of a distoangular impaction, with a buccal deflection and with the mesial surface accessible, where Fig. 288 A is a lingual view and Fig. 288 B is an occlusal view of the same case.

In Fig. 288 A there is an overlap of the mesial surface of the third molar upon the distobuccal surface of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface of this tooth is visible. The second molar is deflected lingually, which position is indicated by a part of the occlusal surface being visible. There is no overlap, at the contact point, of the first molar upon the second. The



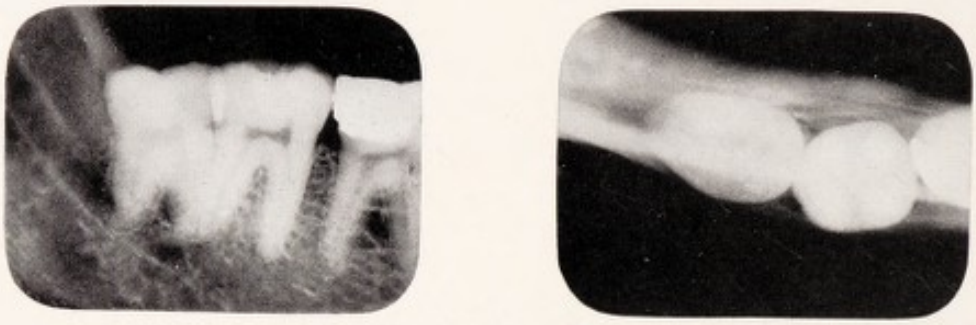
A B

Fig. 288. — Distoangular Impaction. Same case of distoangular impaction, where there is a buccal deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

ossistructure extends over the distoclusal surface, on the entire distal surface and on the greater part of the lingual and buccal surfaces.

In Fig. 288 B the buccal surface of the crown of the third molar is deflected buccally out of alignment with the corresponding surface of the second, and a part of the mesial surface of the third molar is deflected buccally out of alignment with the distobuccal surface of the second. The ossistructure on the lingual surface is very thin compared with that on the buccal surface.

In Fig. 289 the condition is similar to that shown in Fig. 288, except that in Fig. 289 A there is a contact of the mesial root of the third molar with the distal root of the second.

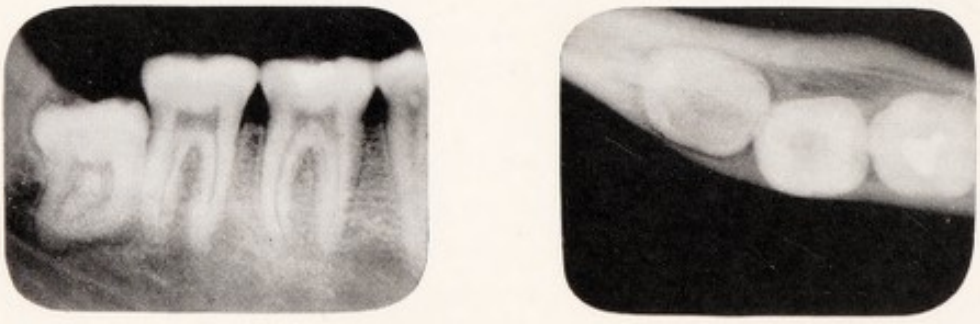


A B

Fig. 289. — Distoangular Impaction. Same case of distoangular impaction, where there is a buccal deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

In Fig. 290 are shown two radiograms of a distoangular impaction, with a buccal deflection and with the mesial surface accessible, where Fig. 290 A is a lingual view and Fig. 290 B is an occlusal view of the same case.

In Fig. 290 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second, and there is a slight space between these two surfaces. The mesial root of the third molar is in contact with the distal root of the second, and the pressure, due to the contact, has deflected the mesial surface of the third molar distally to such an extent that the shadow, which would indicate a buccal deflec-



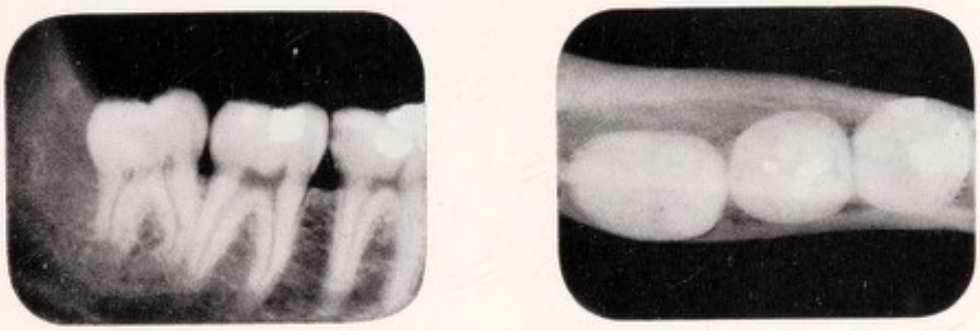
A B

Fig. 290. — Distoangular Impaction. Same case of distoangular impaction, where there is a buccal deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

tion, is prevented in this case from being cast upon the second molar. This is the type of case where an occlusal radiogram should always be made to determine the possibility of a buccal deflection. The ossistructure extends over the occlusal surface and on the entire mesial, distal, lingual and buccal surfaces of the third molar.

In Fig. 290 B the buccal surface of the crown of the third molar is deflected buccally out of alignment with the corresponding surface of the second, and a part of the mesial surface of the third molar is deflected buccally out of alignment with the distobuccal surface of the second. The ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface.

Lingual Deflection.—In Fig. 291 is shown a rather unusual case of distoangular impaction, with a lingual deflection caused by the contact of the roots of the third molar with the distal root of the second, where Fig. 291 A is a lingual view and Fig. 291 B is an occlusal view of the same case.



A B

Fig. 291. — Distoangular Impaction. Same case of distoangular impaction, where there is a lingual deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

In Fig. 291 A there is a slight deflection of the occlusal surface of the third molar above the corresponding surface of the second, but no part of the occlusal surface of the third molar is visible. The third molar shows a normal enamel cap and pulp chamber, with no contact of the mesial surface with the distal surface of the second. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The mesial root of the third molar is in contact with the distal root of the second, and usually such a contact has the effect of deflecting the third molar buccally. In this case, however, the reverse is found in the occlusal radiographic and clinical findings, as the crown of the third molar is deflected lingually, a condition which is seldom presented in a case of this character. The buccal surface of the crown of the third molar is deflected lingually out of alignment with the corresponding

surface of the second. The ossistructure on the distal surface of the third molar extends up to the occlusal surface (which is slightly involved by a pathologic condition) and on part of the lingual and buccal surfaces.

In Fig. 291 B the buccal surface of the crown of the third molar is deflected lingually out of alignment with the corresponding surface of the second. The crown of the third molar has the same formation as the crowns of the first and second molars, but the occlusal surface is not deflected lingually, as is usually the case in a lingual deflection.

Lingual Deflection, with the Mesial Surface Accessible.—In Fig. 292 are shown two radiograms of a distoangular impaction, with a lingual deflection and with the mesial surface accessible, where Fig. 292 A is a lingual view and Fig. 292 B is an occlusal view of the same case.

In Fig. 292 A there is a contact of the mesial surface of the third molar with the distal surface of the second, and a part of the occlusal surface of the third molar is visible. The first and second molars show

A B

Fig. 292. — Distoangular Impaction. Same case of distoangular impaction, where there is a lingual deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

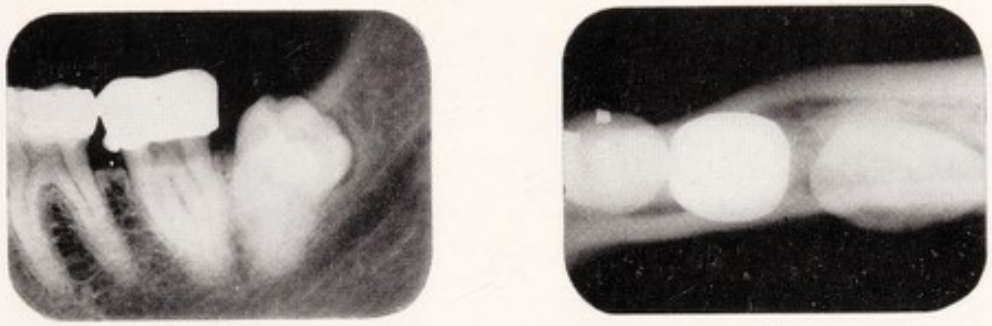
definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The mesial root of the third molar is in contact with the distal root of the second. The ossistructure extends over the distoclusal surface, on the entire distal surface and on the greater part of the lingual and buccal surfaces of the third molar.

In Fig. 292 B the alignment of the buccal surface of the crown of the third molar, on account of the lingual inclination of the tooth, cannot be definitely determined, owing to the shadow of the roots being cast upon the buccal surface. The occlusal surface of the third molar is compared with the alignment of the lingual surface of the second. No positive definition can be obtained of the ossistructure on the buccal or lingual surface of the third molar.

Torsional Deflection, with the Surface that Would Normally be the Mesial Surface Accessible.—In Fig. 293 are shown two radiograms

of a distoangular impaction, with a torsional deflection and with the surface that would normally be the mesial surface accessible, where Fig. 293 A is a lingual view and Fig. 293 B is an occlusal view of the same case.

In Fig. 293 A there is no contact of the surface that would normally be the mesial surface of the third molar with the distal surface of the second, and a part of the occlusal surface of the third molar is visible. No positive definition can be obtained of the root formation of the third molar, and the pulp chamber is obliterated. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surface of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure extends over the greater part of the occlusal surface of the third molar, on the entire surface that would normally be the distal surface and on the greater part of the surfaces that would normally be the lingual and buccal surfaces.



A B

Fig. 293. — Distoangular Impaction. Same case of distoangular impaction, where there is a torsional deflection, with surface that would normally be mesial accessible. *A*, lingual view; *B*, occlusal view.

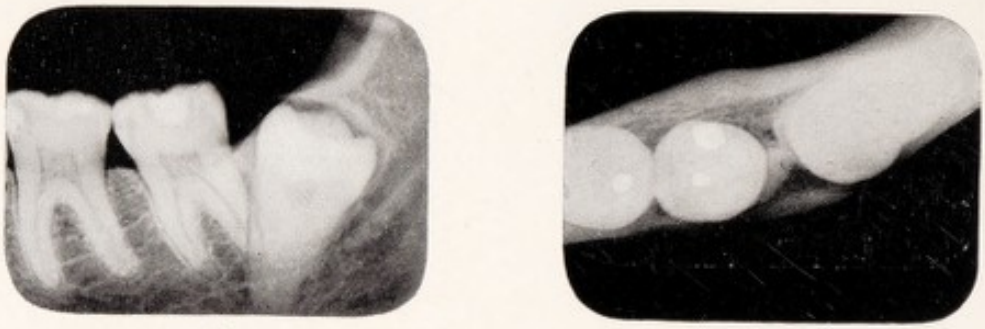
In Fig. 293 B no definition can be obtained of the alignment of the surface that would normally be the buccal surface of the third molar, as the roots cast a shadow upon this surface. A part of the distal root of the second molar is visible, owing to the large space between the second and third molars. The crown of the third molar is blurred on account of the upward curve of the distal end of the film. No positive definition can be obtained of the ossistructure on the surface that would normally be the buccal or lingual surface of the third molar.

Torsional Deflection, with the Surface that Would Normally be the Mesial Surface Inaccessible.—In Fig. 294 are shown two radiograms of a distoangular impaction, with a torsional deflection and with the surface that would normally be the mesial surface inaccessible, where Fig. 294 A is a lingual view and Fig. 294 B is an occlusal view of the same case.

In Fig. 294 A there is no contact of the surface that would normally be the mesial surface of the third molar with the distal surface of the

second, and a part of the occlusal surface is visible. No positive definition can be obtained of the root formation, and the pulp chamber is practically obliterated, only a small spot being shown. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure extends over the entire occlusal surface of the third molar and the surfaces that would normally be the mesial, distal, lingual and buccal surfaces.

In Fig. 294 B no positive definition can be obtained of the alignment of the third molar. A part of the distal root of the second molar is visible, owing to the mesial inclination of the second molar and the large space between the second and third molars. The crown of the third molar is blurred on account of the upward curve of the distal end of the film. No positive definition can be obtained of the ossistructure on the surface that would normally be the buccal or lingual surface of the third molar.



A B

Fig. 294. — Distoangular Impaction. Same case of distoangular impaction, where there is a torsional deflection, with surface that would normally be mesial inaccessible. *A*, lingual view where no positive definition of root formation can be obtained, with ossistructure extending over entire tooth; *B*, occlusal view.

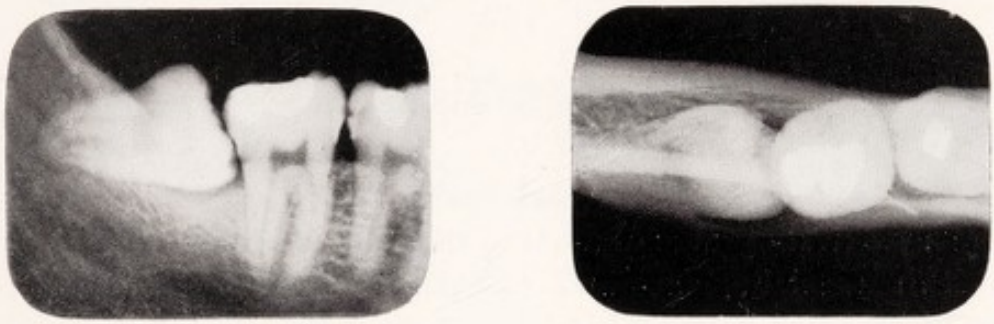
HORIZONTAL IMPACTION

Where the third molar is impacted in a horizontal position, the comparative alignments to be determined from the lingual and occlusal radiograms are as follows: (1) the alignment of the buccal and lingual surfaces of the third molar with the corresponding surfaces of the second; (2) the alignment of the third molar where a part of the crown is deflected buccally out of alignment with the distobuccal surface of the second molar; (3) the alignment of the third molar where its occlusal and buccal surfaces are deflected lingually out of alignment with the buccal surface of the second; (4) the alignment of the third molar where its occlusal surface is deflected lingually, and a part of the mesioclusal surface is in contact with the distobuccal surface of the second molar, with the buccal surface of the third molar deflected buccally out of alignment with the corresponding surface of the second, and (5) the

alignment of the surfaces that would normally be the buccal and lingual surfaces of the third molar, when the tooth is in a torsional position, with the buccal and lingual surfaces of the second.

No Deflection, with the Mesial Surface Accessible—In Fig. 295 are shown two radiograms of a horizontal impaction, with no deflection and with the mesial surface accessible, where Fig. 295 A is a lingual view and Fig. 295 B is an occlusal view of the same case.

In Fig. 295 A there is no overlap of the occlusal surface of the third molar upon the distobuccal surface of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the gingival third, but the greater part of the lingual and buccal surfaces is free of ossistructure.



A B

Fig. 295. — Horizontal Impaction. Same case of horizonal impaction where there is no deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

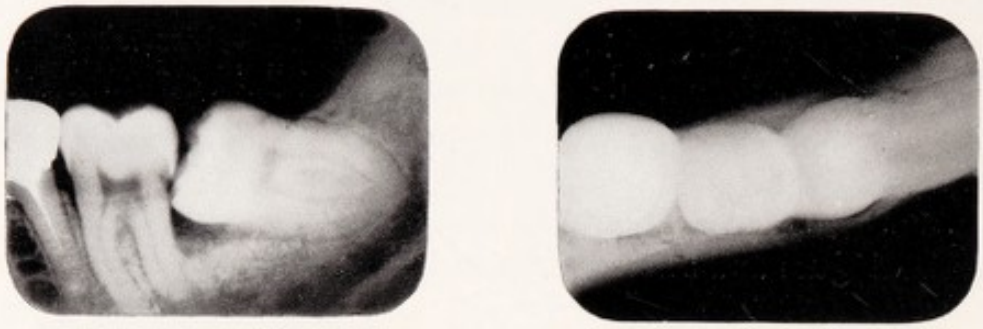
In Fig. 295 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second, and the occlusal surface of the third molar is of about the same width as the distal surface of the second. The ossistructure on the lingual surface of the third molar is thin compared with the ossistructure on the buccal surface.

In Fig. 296 are shown two radiograms of a horizontal impaction, with no deflection and with the mesial surface accessible, where Fig. 296 A is a lingual view and Fig. 296 B is an occlusal view of the same case.

In Fig. 296 A there is no overlap of the occlusal surface of the third molar upon the distobuccal surface of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point,

of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the gingival third, and below the mesial surface is involved by a pathologic condition, but the greater part of the lingual and buccal surfaces is free of ossistructure.

In Fig. 296 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second, and the occlusal surface of the third molar is of about the same width as the distal surface of the second. No positive definition can be obtained of the ossistructure on the buccal or lingual surface of the third molar.



A B

Fig. 296. — Horizontal Impaction. Same case of horizontal impaction where there is no deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

No Deflection, with the Mesial Surface Inaccessible.—In Fig. 297 are shown two radiograms of a horizontal impaction, with no deflection and with the mesial surface inaccessible, where Fig. 297 A is a lingual view and Fig. 297 B is an occlusal view of the same case.

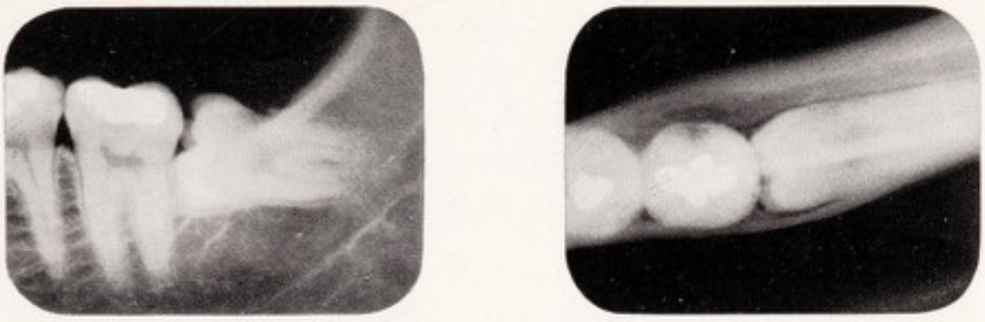
In Fig. 297 A there is no overlap of the occlusal surface of the third molar upon the distobuccal surface of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the gingival third, on the buccal and lingual surfaces beyond the gingival third and on the entire mesial surface.

In Fig. 297 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second, and the occlusal surface of the third molar is slightly narrower than the distal surface of the second. The ossistructure on the lingual surface of the third molar is thin compared with the ossistructure on the buccal surface.

In Fig. 298 are shown two radiograms of a horizontal impaction, with no deflection and with the mesial surface inaccessible, where Fig.

298 A is a lingual view and Fig. 298 B is an occlusal view of the same case.

In Fig. 298 A there is no overlap of that part of the occlusal surface of the third molar that is impinging upon the gingival third of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second.



A B

Fig. 297.—Horizontal Impaction. Same case of horizontal impaction where there is no deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

The ossistructure on the distal surface extends up to the gingival third, on the entire mesial surface and on the greater part of the buccal and lingual surfaces of the third molar.

In Fig. 298 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second, and the occlusal surface of the third molar is of the same width as the distal surface of the second. The ossistructure on the lingual surface of the third molar is thin compared with that on the buccal surface.

In Fig. 299 are shown two radiograms of a horizontal impaction, with no deflection and with the mesial surface inaccessible, where Fig. 299 A is a lingual view and Fig. 299 B is an occlusal view of the same case.

A B

Fig. 298. — Horizontal Impaction. Same case of horizontal impaction where there is no deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

In Fig. 299 A there is no overlap of the occlusal surface of the third molar upon the distal root of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends on the distal surface slightly beyond the gingival third (which is involved by a pathologic condition) and on the entire mesial, lingual and buccal surfaces.

In Fig. 299 B the buccal surface of the third molar is in alignment with the corresponding surface of the second. Although the third molar is very small compared with the second, this condition has not caused its buccal surface to be deflected out of alignment with the corresponding surface of the second molar. The occlusal surface of the

A B

Fig. 299. — Horizontal Impaction. Same case of horizontal impaction where there is no deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

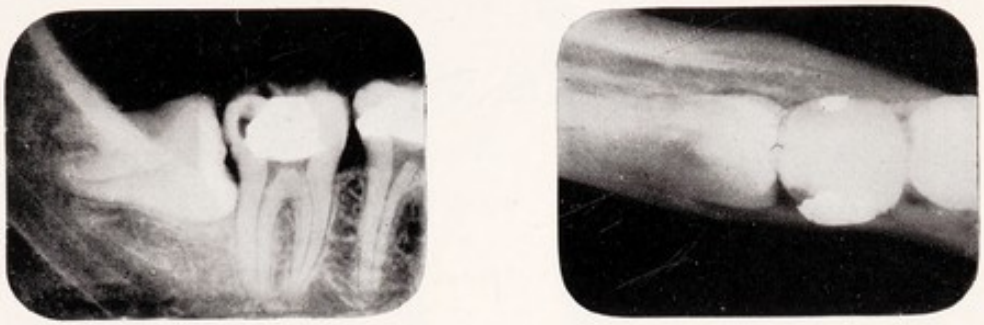
crown of the third molar is deflected against the buccal half of the distal surface of the second, but the crown of the third, on account of its small size, is not in contact with the lingual half of the distal surface of the second molar. The ossistructure on the lingual surface of the third molar should be compared with that on the buccal surface.

In Fig. 300 are shown two radiograms of a horizontal impaction, with no deflection and with the mesial surface inaccessible, where Fig. 300 A is a lingual view and Fig. 300 B is an occlusal view of the same case.

In Fig. 300 A there is no overlap of the occlusal surface of the third molar upon the distobuccal surface of the second. The greater part of the occlusal surface of the third molar is deflected toward the distal surface of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second.

The ossistructure on the distal surface of the third molar extends up to the gingival third, on the buccal and lingual surfaces beyond the gingival third and on the entire mesial surface.

In Fig. 300 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second. The occlusal surface of the third molar is of the same width as the distal surface of the second. The ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface.



A B

Fig. 300. — Horizontal Impaction. Same case of horizontal impaction where there is no deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

In Fig. 301 are shown two radiograms of a horizontal impaction, with no deflection and with the mesial surface inaccessible, where Fig. 301 A is a lingual view and Fig. 301 B is an occlusal view of the same case.

In Fig. 301 A there is no contact of the occlusal surface of the third molar with the distal surface of the second, and there is quite a space between these two surfaces. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure extends on the entire mesial, distal, lingual and buccal surfaces of the third molar, and there is an interseptum between the occlusal surface of the third molar and the distal root of the second.

A B

Fig. 301. — Horizontal Impaction. Same case of horizontal impaction where there is no deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

In Fig. 301 B the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second. The occlusal surface of the third molar is of the same width as the distal surface of the second. There is a space between the occlusal surface of the third molar and the distal surface of the second. The ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface.

In Fig. 302 are shown lingual and occlusal radiograms of two cases similar to those shown in Fig. 301, except that the ossistructure on the third molar does not extend so far upon the distal surface, and there is greater space between the occlusal surface of the third molar and the

Fig. 302. — Horizontal Impaction. Two cases of horizontal impaction showing lingual and occlusal radiograms where there is no deflection, with mesial surface inaccessible.

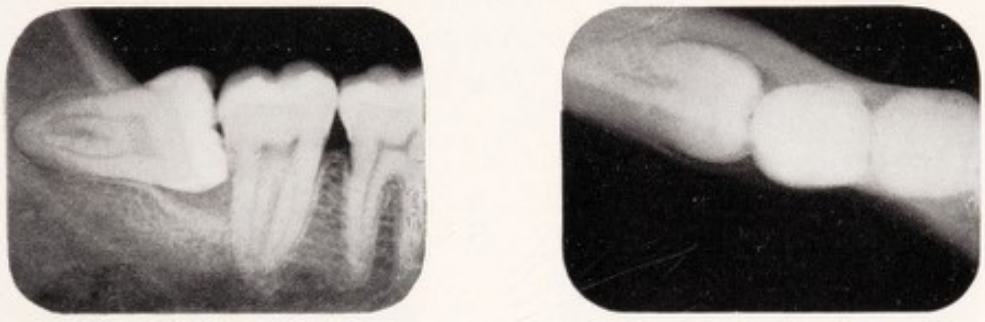
distal surface of the second. These cases are shown to give the operator an idea of the variation that may occur in the size of the space where the occlusal surface of the third molar is not in contact with the distal surface of the second.

Buccal Deflection, with the Mesial Surface Accessible.—In Fig. 303 are shown two radiograms of a horizontal impaction, with a buccal deflection and with the mesial surface accessible, where Fig. 303 A is a lingual view and Fig. 303 B is an occlusal view of the same case.

In Fig. 303 A there is an overlap of a part of the occlusal surface of the third molar upon the distobuccal surface of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal

surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the gingival third and on the lingual and buccal surfaces beyond the gingival third, and below the mesial surface it is involved by a pathologic condition.

In Fig. 303 B the buccal surface of the crown of the third molar is out of alignment to a slight extent buccally with the corresponding surface of the second, and a part of the occlusal surface of the third molar is deflected buccally out of alignment with the distobuccal surface of the second. The alignment of the lingual surface of the second molar should be compared with the corresponding surface of the third. The ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface.

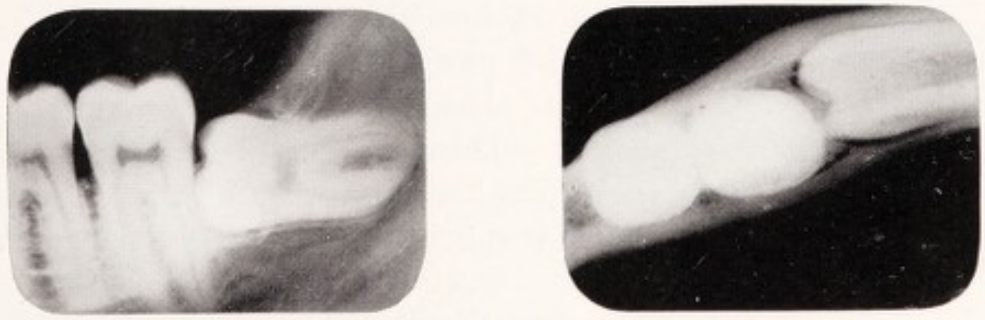


A B

Fig. 303. — Horizontal Impaction. Same case of horizontal impaction where there is a buccal deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

Buccal Deflection, with the Mesial Surface Inaccessible.—In Fig. 304 are shown two radiograms of a horizontal impaction, with a buccal deflection and with the mesial surface inaccessible, where Fig. 304 A is a lingual view and Fig. 304 B is an occlusal view of the same case.

In Fig. 304 A there is an overlap of a part of the occlusal surface of the third molar upon the distal root of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite



A B

Fig. 304.—Horizontal Impaction. Same case of horizontal impaction where there is a buccal deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends slightly beyond the gingival third (which is involved by a pathologic condition), on the entire mesial surface and on the greater part of the lingual and buccal surfaces.

In Fig. 304 B the buccal surface of the crown of the third molar is deflected buccally out of alignment with the corresponding surface of the second. A part of the occlusal surface of the crown of the third molar is deflected buccally out of alignment with the distobuccal surface of the second molar, and a part of the surface is in contact with the distal root of the second molar, and the root is slightly visible. The ossistructure on the lingual surface of the third molar is thin compared with the ossistructure on the buccal surface. An examination should be made of the space anterior to that part of the occlusal surface of the

A B

Fig. 305. — Horizontal Impaction. Same case of horizontal impaction where there is a buccal deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

crown of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second.

In Fig. 305 are shown two radiograms of a horizontal impaction, with a buccal deflection and with the mesial surface inaccessible, where Fig. 305 A is a lingual view and Fig. 305 B is an occlusal view of the same case.

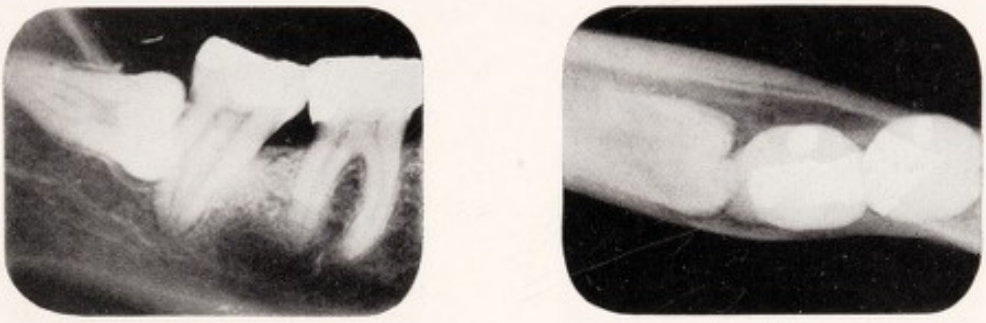
In Fig. 305 A there is an overlap of the occlusal surface of the third molar upon the distobuccal surface of the second. The third molar shows a normal enamel cap and pulp chamber, but no part of the occlusal surface is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends slightly beyond the gingival third, on the entire mesial surface and on the greater part of the lingual and buccal surfaces.

In Fig. 305 B the buccal surface of the crown of the third molar is slightly out of alignment with the corresponding surface of the second. The deflection is the result of the occlusal surface of the third molar

being wider than the distal surface of the second, and this condition results in part of the occlusal surface of the crown of the third molar being deflected buccally out of alignment with the distobuccal surface of the second. The ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface.

In Fig. 306 are shown two radiograms of a horizontal impaction, with a buccal deflection and with the mesial surface inaccessible, where Fig. 306 A is a lingual view and Fig. 306 B is an occlusal view of the same case.

In Fig. 306 A there is a slight overlap of the occlusal surface of the third molar upon the distal root of the second. The third molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The greater part of the occlusal surface of the third molar is in contact with the distal root of the second. The ossistructure on the distal surface of the third molar extends up to the gingival third, on the entire mesial surface and on the greater part of the lingual and buccal surfaces.



A B

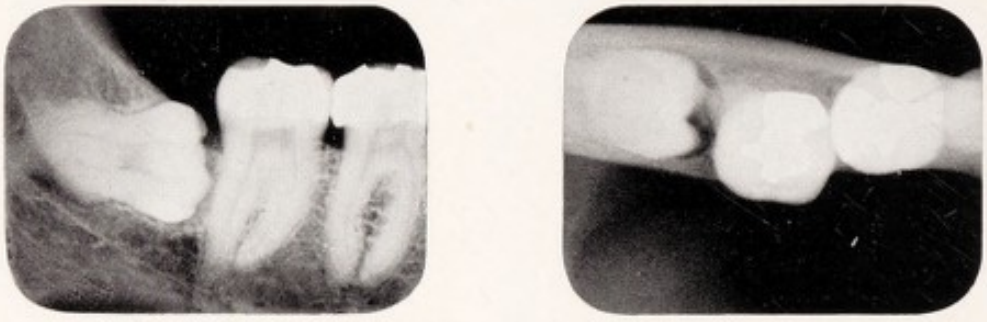
Fig. 306. — Horizontal Impaction. Same case of horizontal impaction where there is a buccal deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

In Fig. 306 B the buccal surface of the crown of the third molar is deflected buccally out of alignment with the corresponding surface of the second. A part of the occlusal surface of the third molar is deflected buccally out of alignment with the distobuccal surface of the second molar, and a part of the surface is in contact with the distal root of the second molar, and the root is slightly visible. The ossistructure on the lingual surface of the third molar is thin compared with that on the buccal surface. The ossistructure anterior to that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar should be observed.

In Fig. 307 are shown two radiograms of a horizontal impaction, with a buccal deflection caused by the lingual deflection of the second molar and with the mesial surface inaccessible, where Fig. 307 A is a lingual view and Fig. 307 B is an occlusal view of the same case.

In Fig. 307 A there is no contact of the occlusal surface of the third molar with the second, and the ossistructure extends over the greater part of the occlusal surface of the third molar. On account of the filling in the second molar the slight lingual deflection of this tooth cannot be positively determined. The ossistructure extends over the entire third molar, with the exception of a small part of the occlusal surface.

In Fig. 307 B the buccal surface of the crown of the third molar is deflected buccally out of alignment with the corresponding surface of the second, as a result of the lingual deflection of the second. There is a space between the occlusal surface of the third molar and



A B

Fig. 307. — Horizontal Impaction. Same case of horizontal impaction where there is a buccal deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

the distal surface of the second, and a part of the distal root of the second molar is visible. The ossistructure on the lingual surface of the third molar is thin compared with that on the buccal surface.

Lingual Deflection, with the Mesial Surface Inaccessible.—In Fig. 308 are shown two radiograms of a horizontal impaction, with a lingual deflection and with the mesial surface inaccessible, where Fig. 308 A is a lingual view and Fig. 308 B is an occlusal view of the same case.

In Fig. 308 A the occlusal surface of the third molar is in close contact with the gingival third of the second, and a part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends to the gingival third, on the entire mesial surface and on the greater part of the lingual and buccal surfaces.

In Fig. 308 B the buccal surface of the crown of the third molar is deflected to a slight extent lingually out of alignment with the corresponding surface of the second. The occlusal surface of the third molar is deflected lingually, and a part of this surface is in close proximity to the distal surface of the second. The ossistructure on the lingual surface is thin compared with that on the buccal surface.

Buccolingual Deflection.—On account of the many variations that occur in the alignment of the third molar when it is deflected buccolingually in a horizontal impaction, with special reference to the relation of the mesioclusal surface of the third molar to the distobuccal surface or distal root of the second, a larger number of cases of this character are presented in order to emphasize the importance of making a correct interpretation of this type of an impaction. It is essential that the position of the buccal surface of the third molar

A B

Fig. 308. — Horizontal Impaction. Same case of horizontal impaction where there is a lingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

be definitely determined, so that the ossisector and exolever may be properly applied and the liability of dislodging the second molar be avoided.

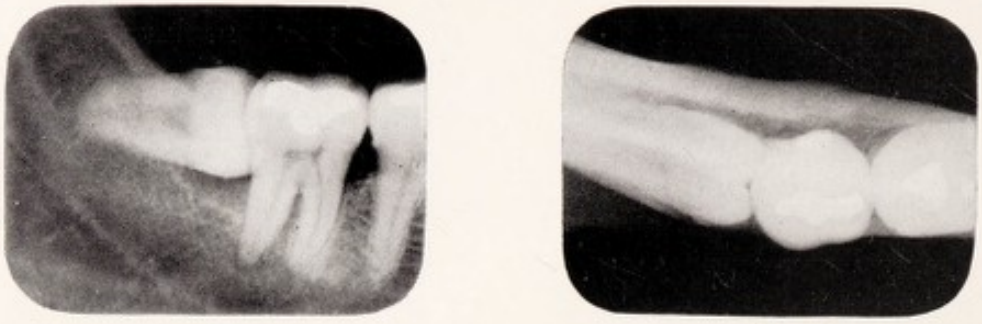
Buccolingual Deflection, with the Mesial Surface Accessible.—In Fig. 309 are shown two radiograms of a horizontal impaction, with a buccolingual deflection and with the mesial surface accessible, where Fig. 309 A is a lingual view and Fig. 309 B is an occlusal view of the same case.

In Fig. 309 A there is an overlap of a part of the occlusal surface of the third molar upon the distobuccal surface of the second, and a part of the occlusal surface is visible. The first molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface of this tooth is visible. The second molar is deflected to a slight extent lingually, a position which is indicated by a part of the occlusal surface being visible. There is no overlap, at the contact point, of the first molar upon the second.

The ossistructure on the distal surface of the third molar extends

almost up to the gingival third, on part of the lingual and buccal surfaces, and below the mesial surface it is involved by a pathologic condition.

In Fig. 309 B the buccal surface of the crown of the third molar is slightly out of alignment buccally with the corresponding surface of the second molar, and part of the occlusal surface of the third molar is in contact with the distobuccal surface of the second. The ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface.



A B

Fig. 309. — Horizontal Impaction. Same case of horizontal impaction where there is a buccolingual deflection, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

Buccolingual Deflection, with the Mesial Surface Inaccessible.— In Fig. 310 are shown two radiograms of a horizontal impaction, with a buccolingual deflection and with the mesial surface inaccessible, where Fig. 310 A is a lingual view and Fig. 310 B is an occlusal view of the same case.

In Fig. 310 A there is an overlap of a part of the occlusal surface of the third molar upon the gingival third of the second, and a part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to

A B

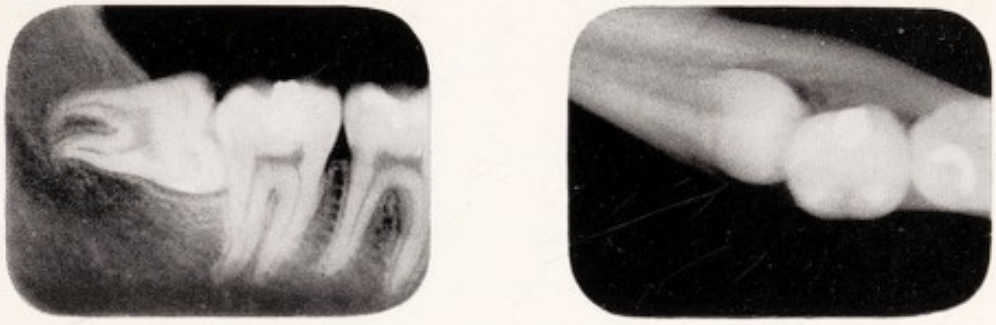
Fig. 310. — Horizontal Impaction. Same case of horizontal impaction where there is a buccolingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

the gingival third, on the entire mesial surface and on the greater part of the lingual and buccal surfaces.

In Fig. 310 B the buccal surface of the crown of the third molar is slightly out of alignment buccally with the corresponding surface of the second, and the occlusal surface of the third molar is in contact with the distobuccal surface of the second. The ossistructure on the lingual surface of the third molar is thin compared with that on the buccal surface.

In Fig. 311 are shown two radiograms of a horizontal impaction, with a buccolingual deflection and with the mesial surface inaccessible, where Fig. 311 A is a lingual view and Fig. 311 B is an occlusal view of the same case.

In Fig. 311 A there is an overlap of a part of the occlusal surface of the third molar upon the distobuccal surface of the second, and a part of the occlusal surface is visible. The first and second molars



A B

Fig. 311. — Horizontal Impaction. Same case of horizontal impaction where there is a buccolingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

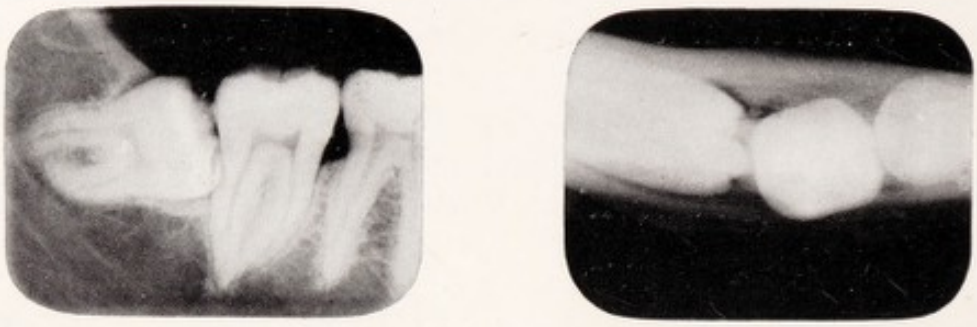
show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the gingival third, on the entire mesial surface and on the greater part of the lingual and buccal surfaces.

In Fig. 311 B the buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second, and the occlusal surface of the third molar is in marked contact with the distobuccal surface of the second. The ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface.

In Fig. 312 are shown two radiograms of a horizontal impaction, with a buccolingual deflection and with the mesial surface inaccessible, where Fig. 312 A is a lingual view and Fig. 312 B is an occlusal view of the same case.

In Fig. 312 A there is an overlap of a part of the occlusal sur-

face of the third molar upon the distobuccal surface of the second, and a part of the occlusal surface is visible. The first molar shows a definite enamel cap and pulp chamber, but no part of the occlusal surface of this tooth is visible. The second molar is deflected to a slight extent lingually, a position which is indicated by a part of the occlusal surface being visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends slightly beyond the gingival third, and on the entire mesial, lingual and buccal surfaces.



A B

Fig. 312. — Horizontal Impaction. Same case of horizontal impaction where there is a buccolingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

In Fig. 312 B the buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second, and a part of the distal root of the latter tooth is visible. Part of the occlusal surface of the third molar is in contact with the distobuccal surface of the distal root of the second. The ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface.

In Fig. 313 are shown two radiograms of a horizontal impaction, with a buccolingual deflection and with the mesial surface inaccessible, where Fig. 313 A is a lingual view and Fig. 313 B is an occlusal view of the same case.

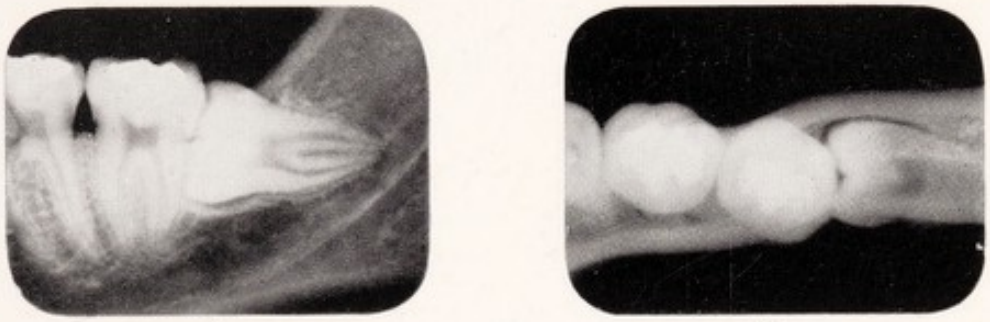
In Fig. 313 A there is a marked overlap of the occlusal surface

A B

Fig. 313. — Horizontal Impaction. Same case of horizontal impaction where there is a buccolingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

of the third molar upon the distobuccal surface of the second. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the gingival third, on the entire mesial surface, on the greater part of the lingual and buccal surfaces, and below the mesial surface it is slightly involved by a pathologic condition.

In Fig. 313 B the buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second. Part of the occlusal surface of the third molar is in contact with the distobuccal surface of the second, and the contact surface extends slightly distal to the bifurcation. There is a space between the buccal surface of the third molar and the ossistructure on this



A B

Fig. 314. — Horizontal Impaction. Same case of horizontal impaction where there is a buccolingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

surface. The ossistructure on the lingual surface of the third molar is thin, and on the buccal surface it is not very heavy.

In Fig. 314 are shown two radiograms of a horizontal impaction, with a buccolingual deflection and with the mesial surface inaccessible, where Fig. 314 A is a lingual view and Fig. 314 B is an occlusal view of the same case.

In Fig. 314 A there is a marked overlap of the occlusal surface of the third molar upon the distobuccal surface and distal root of the second, and a part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends slightly beyond the gingival third, on the entire mesial surface and on the greater part of the lingual and buccal surfaces.

In Fig. 314 B the buccal surface of the crown of the third molar is deflected buccally out of alignment with the corresponding surface of

the second. Part of the occlusal surface of the third molar is in contact with the distobuccal surface and extends almost to the bifurcation. There is a space between the buccal surface of the third molar and the ossistructure on this surface. The ossistructure on the lingual surface of the third molar is very thin compared with that on the buccal surface.

In Fig. 315 are shown two radiograms of a horizontal impaction, with a buccolingual deflection and with the mesial surface inaccessible, where Fig. 315 A is a lingual view and Fig. 315 B is an occlusal view of the same case.

In Fig. 315 A there is an overlap of a part of the occlusal surface of the third molar upon the gingival third of the distal root of the second, and a part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at

A B

Fig. 315. — Horizontal Impaction. Same case of horizontal impaction where there is a buccolingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

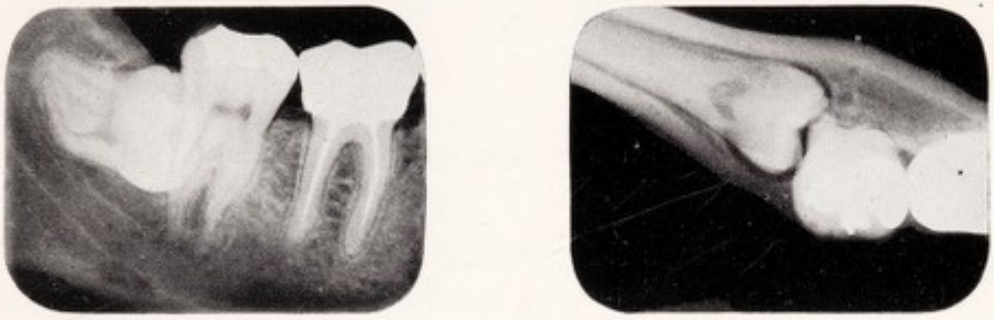
the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends slightly beyond the gingival third (which is involved by a pathologic condition), on the entire mesial surface, on the greater part of the lingual and buccal surfaces, and below the mesial surface it is involved by a pathologic condition.

In Fig. 315 B the buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second. A part of the distal root of the second molar is shown on account of a slight mesial inclination of this tooth. Part of the occlusal surface of the third molar is in contact with the distobuccal surface of the distal root of the second. The ossistructure on the lingual surface of the third molar is thin compared with that on the buccal surface.

In Fig. 316 are shown two radiograms of a horizontal impaction, with a buccolingual deflection and with the mesial surface inaccessible, where Fig. 316 A is a lingual view and Fig. 316 B is an occlusal view of the same case.

In Fig. 316 A there is a marked overlap of the occlusal surface of the third molar upon the distobuccal surface of the distal root of the second, and a part of the occlusal surface is visible. The second molar is inclined to a slight extent mesially, with a large interseptum between the first and second molars. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends almost up to the occlusal surface (which is slightly involved by a pathologic condition) and on the entire mesial, lingual and buccal surfaces.

In Fig. 316 B the buccal surface of the crown of the third molar is deflected buccally out of alignment with the corresponding surface of the second. The contact of the occlusal surface of the third molar with the distal root of the second is not definitely shown on account of the marked mesial inclination of the second molar, but enough of the prevailing condition is presented to give some idea of the alignment of



A B

Fig. 316. — Horizontal Impaction. Same case of horizontal impaction where there is a buccolingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

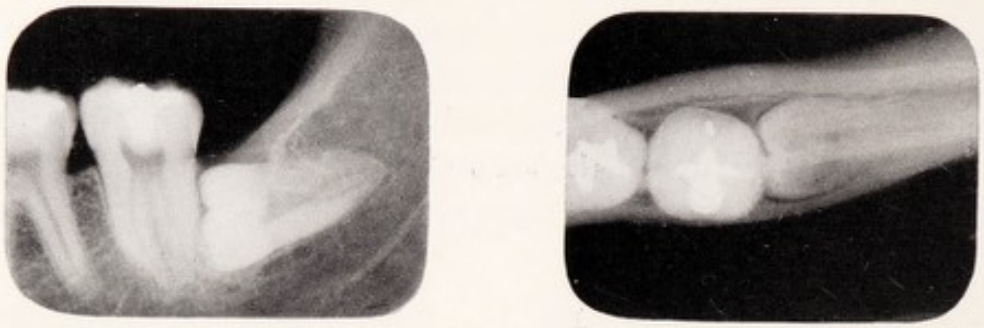
these two teeth. The occlusal surface of the third molar should be compared with the distal surface of the distal root of the second in order to determine the relation of the occlusal surface of the third molar to the distal root of the second. The ossistructure on the lingual surface of the third molar is thin compared with that on the buccal surface.

In Fig. 317 are shown two radiograms of a horizontal impaction, with a buccolingual deflection and with the mesial surface inaccessible, where Fig. 317 A is a lingual view and Fig. 317 B is an occlusal view of the same case.

In Fig. 317 A there is an overlap of a part of the occlusal surface of the third molar upon the apical third of the distal root of the second, and a part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistruc-

ture extends entirely over the third molar, except a small part of the distal surface.

In Fig. 317 B the buccal surface of the crown of the third molar is slightly out of alignment buccally with the corresponding surface of the second. No part of the distal root of the second molar is visible on account of the alignment of the root with the distal surface. The occlusal surface of the third molar appears to be in contact with the distobuccal surface of the second. The almost perfect alignment of the distal surface of the distal root of the second molar with the distal



A B

Fig. 317. — Horizontal Impaction. Same case of horizontal impaction where there is a buccolingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

surface of the crown shows the contact with the crown instead of with the distal root. The ossistructure on the lingual surface of the third molar is heavier than on the corresponding surfaces shown in Figs. 314, 315, and 316, and on the buccal surface the ossistructure is heavier than on the lingual surface.

In Fig. 318 are shown two radiograms of a horizontal impaction, with a buccolingual deflection and with the mesial surface inaccessible, where Fig. 318 A is a lingual view and Fig. 318 B is an occlusal view of the same case.

In Fig. 318 A the case is similar to the one shown in Fig. 317 A, except that in the former case there is a slight pathologic condition on

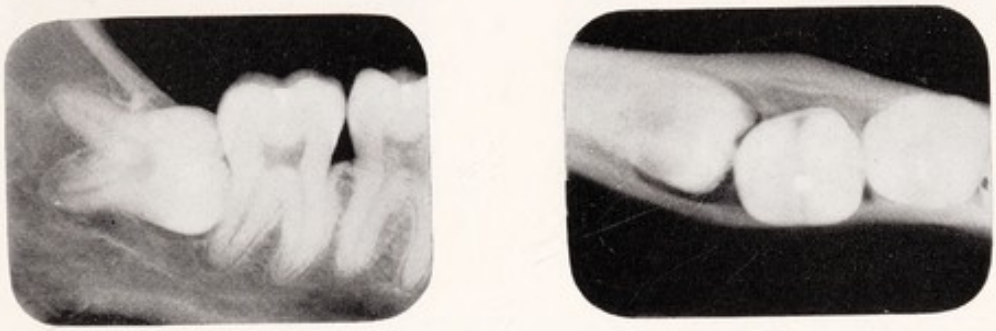
A B

Fig. 318. — Horizontal Impaction. Same case of horizontal impaction where there is a buccolingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

the distal surface of the third molar. In Fig. 318 A the distal surface of the distal root of the third molar is in alignment with the distal surface of the crown of the second molar, while in Fig. 316 A the distal root of the third molar is out of alignment distally with the distal surface of the crown of the second molar.

In Fig. 317 B the occlusal surface of the third molar appears to be in contact with the distobuccal surface of the second, but such is not the case, as the contact is at the apical third of the distal root of the second molar, while in Fig. 318 B the distal root of the second molar is visible, and the third molar is in contact with the apical third of the distal root of the second.

In Fig. 319 are shown two radiograms of a horizontal impaction with a buccolingual deflection and with the mesial surface inaccessible, where Fig. 319 A is a lingual view and Fig. 319 B is an occlusal view of the same case.



A B

Fig. 319. — Horizontal Impaction. Same case of horizontal impaction where there is a buccolingual deflection, with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

In Fig. 319 A there is a marked overlap of the occlusal surface of the third molar upon the distobuccal surface and distal root of the second, and a part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the gingival third (which is involved by a pathologic condition), on the entire mesial surface and on the greater part of the lingual and buccal surfaces.

In Fig. 319 B the buccal surface of the crown of the third molar is out of alignment buccally with the distobuccal surface of the second. There is a space shown between the occlusal surface of the third molar and the distobuccal surface of the second, owing to the relation of the contact of the crown of the third molar with the distal root of the second. The ossistructure on the lingual surface of the third molar is thin compared with that on the buccal surface.

Torsional Deflection, with the Surface that Would Normally be the Mesial Surface Inaccessible.—In Fig. 320 are shown two radiograms of a horizontal impaction, with a torsional deflection and with the surface that would normally be the mesial inaccessible, where Fig. 320 A is a lingual view and Fig. 320 B is an occlusal view.

In Fig. 320 A there is a slight overlap of a part of the occlusal surface of the third molar upon the distal surface of the second, but no part of the occlusal surface is visible. The indefinite arrangement of the cusps of the third molar and an indefinite pulp chamber, with the apparent presence of an extra root, indicate a torsional deflection. The ossistructure extends on the surfaces that would normally be (1) the distal surface of the third molar up to the gingival third; (2) the entire mesial surface, and (3) the greater part of the lingual and buccal surfaces.

A B

Fig. 320. — Horizontal Impaction. Same case of horizontal impaction where there is a torsional deflection, with surface that would normally be mesial inaccessible. *A*, lingual view; *B*, occlusal view.

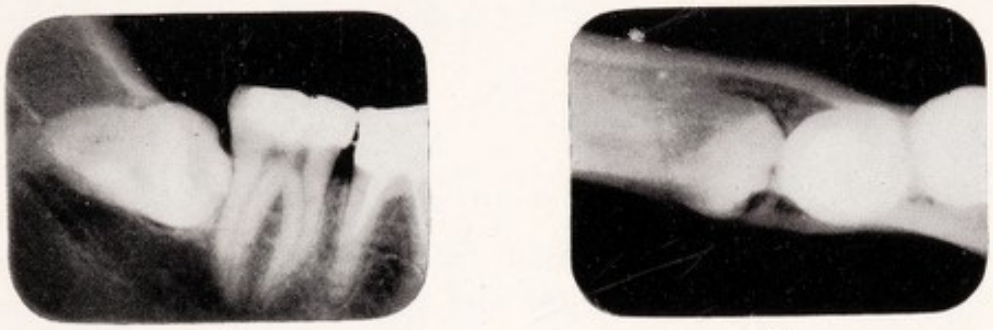
In Fig. 320 B the surface that would normally be the buccal surface of the crown of the third molar is out of alignment quite a distance buccally with the corresponding surface of the second. A part of the occlusal surface of the third molar is deflected buccally out of alignment quite a distance from the distobuccal surface of the second and a part of the surface is in contact with the distal surface of the second molar. In addition to a torsional deflection of the third molar, there is a buccal deflection. The ossistructure on the surface that would normally be the lingual surface of the third molar is heavier than is usually seen, and on the surface that would normally be the buccal the ossistructure is not as heavy as it is on the lingual surface.

In Fig. 321 are shown two radiograms of a horizontal impaction, with a torsional and lingual deflection and with the surface that would normally be the mesial inaccessible, where Fig. 321 A is a lingual view and Fig. 321 B is an occlusal view of the same case.

In Fig. 321 A a part of the occlusal surface of the third molar is visible, and there is no contact of the third molar with the second. The first and second molars show definite enamel caps and pulp

chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure extends on the surface that would normally be the distal surface of the third molar slightly beyond the gingival third, and on the surfaces that would normally be the entire mesial, lingual and buccal.

In Fig. 321 B the surface that would normally be the mesiobuccal is deflected to a slight extent lingually out of alignment with the buccal surface of the second molar. The occlusal surface of the third molar is inclined lingually, and that part of the surface that is in close contact with the distal surface of the second molar is shown. The ossistructure on the surface that would normally be the lingual surface of the third molar is thin compared with that on the surface that would normally be the buccal.



A B

Fig. 321. — Horizontal Impaction. Same case of horizontal impaction where there is a torsional and a lingual deflection, with surface that would normally be mesial inaccessible. *A*, lingual view; *B*, occlusal view.

LINGUOANGULAR IMPACTION

In Fig. 322 are shown two radiograms of a linguoangular impaction, with the mesial surface accessible, where Fig. 322 A is a lingual view and Fig. 322 B is an occlusal view of the same case.

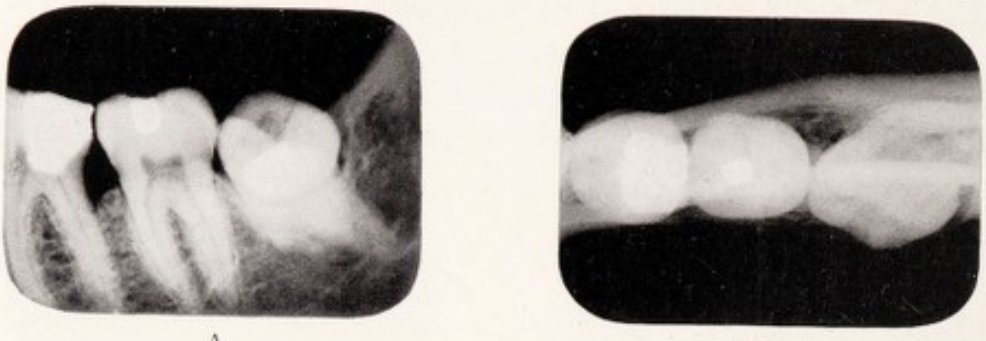
In Fig. 322 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second, and the greater part of the occlusal surface of the third molar is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The foreshortening of the roots of the third molar and the visibility of the greater part of the occlusal surface indicate a linguoangular deflection. The ossistructure on the distal surface of the third molar extends up to the occlusal surface, and on the lingual and buccal surfaces beyond the gingival third.

In Fig. 322 B the buccal surface of the crown of the third molar is out of alignment lingually with the corresponding surface of the second, and a faint definition of the roots of the third molar is visible.

The alignment of the occlusal surface of the third molar should be compared with the alignment of the lingual surface of the second. No positive definition can be obtained of the ossistructure on the buccal or lingual surface of the third molar.

In Fig. 323 are shown two radiograms of a linguoangular impaction, with the mesial surface accessible, where Fig. 323 A is a lingual view and Fig. 323 B is an occlusal view of the same case.

In Fig. 323 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second, and the greater part of the

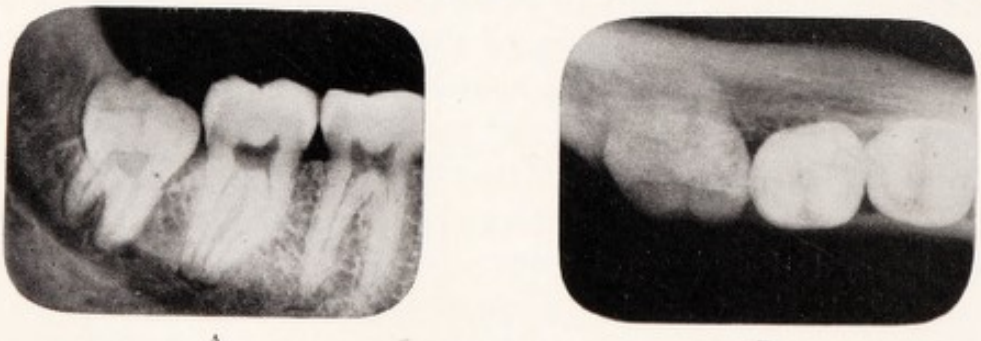


A B

Fig. 322. — Linguoangular Impaction. Same case of linguoangular impaction, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

occlusal surface of the third molar is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The foreshortening of the roots of the third molar and the visibility of the greater part of the occlusal surface indicate a linguoangular deflection. The ossistructure extends over the entire distal surface, and on the greater part of the lingual and buccal surfaces.

In Fig. 323 B the buccal surface of the crown of the third molar is deflected lingually out of alignment with the corresponding surface of the second, but the extent of the deflection cannot be definitely determined on accoun: of the shadow cast by the roots upon the buccal surface. The alignment of the occlusal surface of the third molar should be compared with the lingual surface of the second.



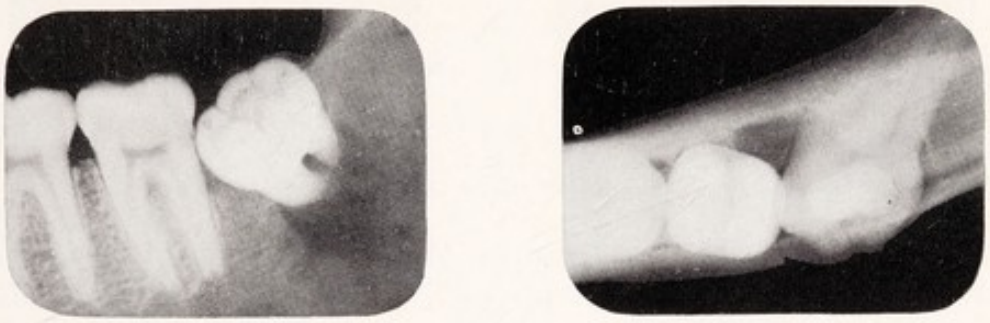
A B

Fig. 323. — Linguoangular Impaction. Same case of linguoangular impaction, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

On account of the marked lingual deflection of the third molar, a part of the roots of this tooth is shown. No positive definition can be obtained of the ossistructure on the buccal or lingual surface of the third molar.

In Fig. 324 are shown two radiograms of a linguoangular impaction, with the mesial surface accessible, where Fig. 324 A is a lingual view and Fig. 324 B is an occlusal view of the same case.

In Fig. 324 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second, and the greater part of the occlusal surface of the third molar is visible, with only a small part of the root formation shown. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the occlusal



A B

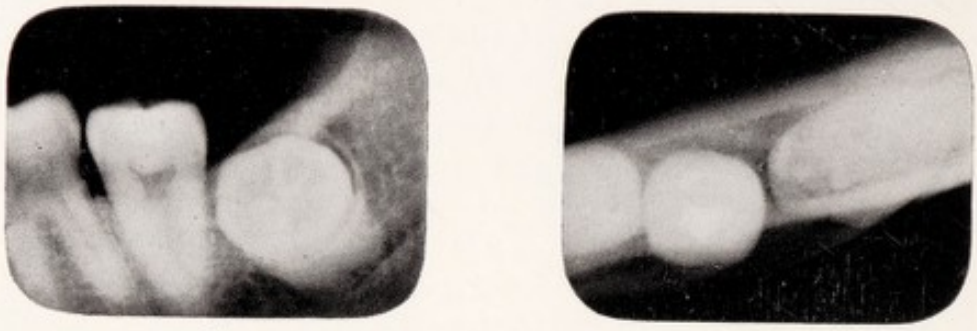
Fig. 324. — Linguoangular Impaction. Same case of linguoangular impaction, with mesial surface accessible. *A*, lingual view; *B*, occlusal view.

surface, and on the lingual and buccal surfaces slightly beyond the gingival third.

In Fig. 324 B the buccal surface of the crown of the third molar is out of alignment lingually with the corresponding surface of the second. The occlusal surface of the third molar is markedly inclined lingually, with the surface almost in alignment with the lingual surface of the second. A part of the mesial surface of the third molar appears to be in contact with the distal surface of the second, because of the shadow cast upon the distal surface of the second molar by the angular position of the tooth. The root formation is quite definitely shown, and the tooth verges on a complete lingual deflection. More of the root formation is shown than can be seen in a slight linguoangular impaction. No positive definition can be obtained of the ossistructure on the buccal or lingual surface of the third molar.

In Fig. 325 are shown two radiograms of a linguoangular impaction, with the mesial surface inaccessible, where Fig. 325 A is a lingual view and Fig. 325 B is an occlusal view of the same case.

In Fig. 325 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second. There is a medium-sized interseptum between the second and third molars, and the greater part of the occlusal surface of the third molar is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure extends over the entire occlusal, mesial, distal and buccal surfaces, with a large interseptum between the second and third molars.



A B

Fig. 325. — Linguoangular Impaction. Same case of linguoangular impaction, where mesial surface is inaccessible. *A*, lingual view; *B*, occlusal view.

In Fig. 325 B no definition can be obtained of the alignment of the buccal surface of the third molar on account of the shadow cast by the roots of the third molar upon the buccal surface. No positive definition can be obtained of the ossistructure on the buccal or lingual surface of the third molar.

In Fig. 326 are shown two radiograms of a linguoangular impaction, with the mesial surface inaccessible, where Fig. 326 A is a lingual view and Fig. 326 B is an occlusal view of the same case.

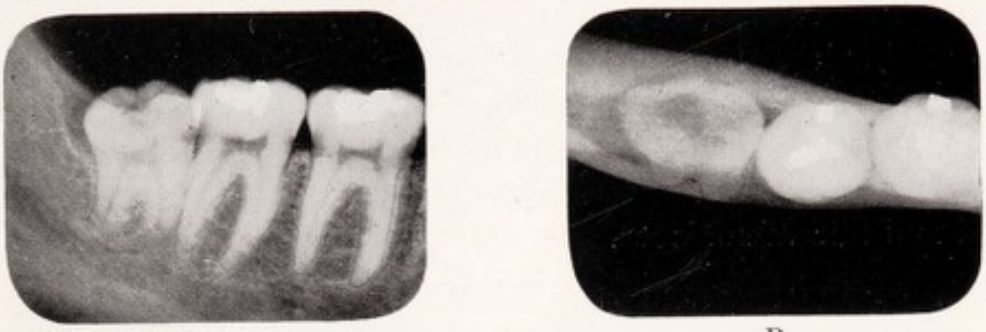
In Fig. 326 A there is no overlap of the mesial surface of the third molar upon the distal root of the second, and the greater part of the occlusal surface of the third molar is visible. A small part of the roots is visible and the tooth verges on a complete lingual deflection.

A B

Fig. 326. — Linguoangular Impaction. Same case of linguoangular impaction, where mesial surface is inaccessible; *A*, lingual view; *B*, occlusal view.

The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure extends over the entire tooth.

In Fig. 326 B no definition can be obtained of the alignment of the buccal surface of the third molar with the corresponding surface of the second, on account of the shadow cast by roots of the third molar. There is an interseptum between the second and third molars.



A B

Fig. 327. — Buccoangular Impaction. Same case of a buccoangular impaction, where mesial surface is accessible. *A*, lingual view; *B*, occlusal view.

BUCCOANGULAR IMPACTION

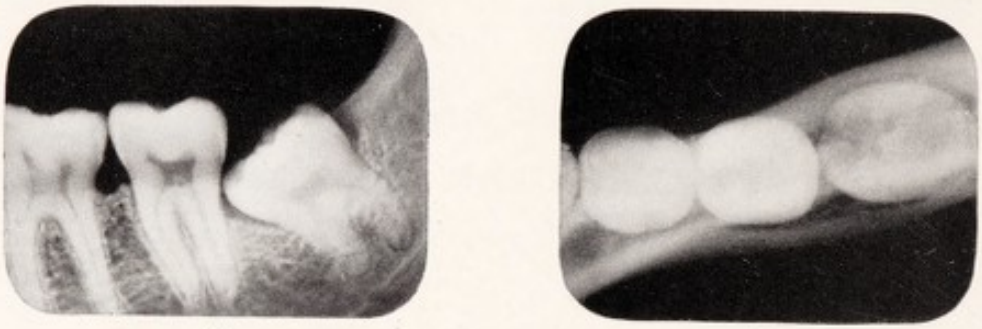
In Fig. 327 are shown two radiograms of a buccoangular impaction, with the mesial surface accessible, where Fig. 327 A is a lingual view and Fig. 327 B is an occlusal view of the same case.

In Fig. 327 A there is an overlap of the mesial surface of the third molar upon the distobuccal surface of the second, and a part of the occlusal surface of the third molar is visible. This case may be mistaken for a distoangular impaction with a buccolingual deflection, but such a condition does not occur in a distoangular impaction, and this type of a case must be checked with an occlusal radiogram. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar extends up to the occlusal surface (which is slightly involved by a pathologic condition), and on the greater part of the lingual and buccal surfaces. The mesial root of the third molar is in close contact with the distal root of the second.

In Fig. 327 B the occlusal surface of the third molar is not definitely outlined because the roots are superimposed upon the crown. The buccal surface of the crown is out of alignment buccally with the corresponding surface of the second molar, and a part of the roots of the third molar is shown on the lingual. No positive definition can be obtained of the ossistructure on the buccal or lingual surface of the third molar.

In Fig. 328 are shown two radiograms of a buccoangular impaction, with the mesial surface inaccessible, where Fig. 328 A is a lingual view and Fig. 328 B is an occlusal view of the same case.

In Fig. 328 A there is no overlap of the mesial surface of the third molar upon the distal surface of the second, and the occlusal surface of the third molar is not visible. This case may be mistaken for a mesioangular impaction where there is no deflection, as the occlusal surface is not visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure on the distal surface of the third molar (which is slightly involved by a pathologic condition), extends up to the occlusal surface, and on the greater part of the lingual and buccal surfaces.



A B

Fig. 328. — Buccoangular Impaction. Same case of buccoangular impaction, where mesial surface is inaccessible. *A*, lingual view; *B*, occlusal view.

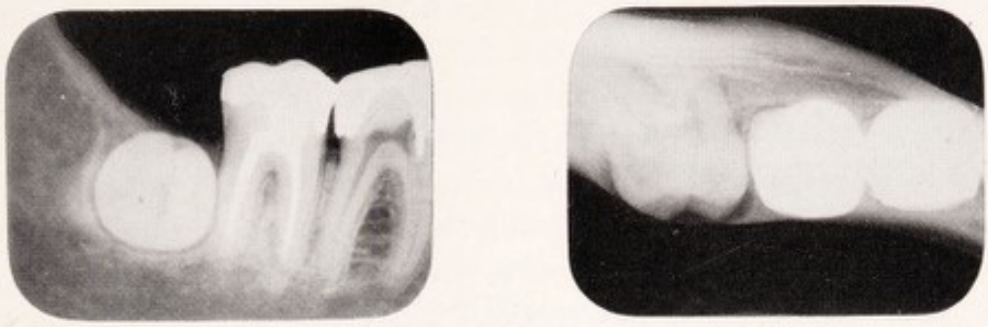
In Fig. 328 B the occlusal surface of the third molar appears like a lingual deflection and is directed to a slight extent buccally. The buccal surface of the crown of the third molar is out of alignment buccally with the corresponding surface of the second, and a part of the roots of the third molar is shown on the lingual surface. The ossistructure on the buccal surface is heavier than that on the lingual surface.

COMPLETE LINGUAL IMPACTION

In Fig. 329 are shown two radiograms of a complete lingual impaction, with the mesial surface inaccessible, where Fig. 329 A is a lingual view and Fig. 329 B is an occlusal view of the same case.

In Fig. 329 A the occlusal surface is shown in the form of a disk, but no part of the root formation is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. There is no overlap, at the contact point, of the first molar upon the second. The ossistructure, except a small area on the buccal surface, extends over the entire third molar.

In Fig. 329 B the occlusal surface of the third molar is shown on the lingual side of the arch and the roots are directed buccally. There is a small ledge of ossistructure over the occlusal surface.



A B

Fig. 329. — Complete Lingual Impaction. Same case of complete lingual deflection with mesial surface inaccessible. *A*, lingual view; *B*, occlusal view.

DOUBLE IMPACTION OF THE SECOND AND THIRD MOLARS

In Fig. 330 are shown two radiograms of an impaction of the second and third molars, where Fig. 330 A is a lingual view and Fig. 330 B is an occlusal view of the same case.

In Fig. 330 A there is an overlap of the occlusal surface of the third molar upon the distobuccal surface of the second, and part of the occlusal surface is visible, which indicates a buccolingual deflection, and the mesial surface of the third molar is inaccessible. The ossistructure on the distal surface of the third molar extends slightly beyond the gingival third, on the entire mesial surface and on the greater part of the lingual and buccal surfaces. The second molar, owing to the pressure of the third molar, is deflected to a slight extent lingually.

In Fig. 330 B the occlusal surface of the second molar is deflected lingually, and a part of the roots is shown on the buccal surface. The relation of the occlusal surface of the third molar to the deflected second molar is shown. There is a space between the lingual surface of

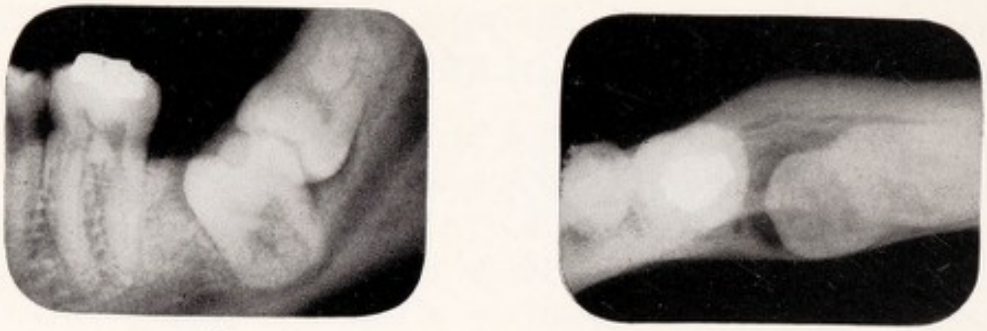
A B

Fig. 330. — Impacted Second and Third Molars. Case where second and third molars are impacted. *A*, lingual view; *B*, occlusal view.

the third molar and the ossistructure, and also a space between the buccal surface and the ossistructure on this surface.

In Fig. 331 are shown two radiograms of an impaction of the second and third molars, where Fig. 331 A is a lingual view and Fig. 331 B is an occlusal view of the same case.

In Fig. 331 A there is an overlap of the occlusal surface of the third molar upon the distobuccal surface of the second, and part of the occlusal surface is visible, thus indicating a buccolingual deflection, with the mesial surface inaccessible. The second molar is deflected lingually and is not in contact with the first molar, as there is a large interseptum between the two teeth. The ossistructure on the distal surface of the third molar extends up to the gingival third, on the entire mesial, lingual and buccal surfaces and also extends over the entire second molar.



A B

Fig. 331. — Impacted Second and Third Molars. Same case where second and third molars are impacted. *A*, lingual view; *B*, occlusal view.

In Fig. 331 B the crown of the second molar is deflected lingually and the third molar is deflected buccolingually, and a space is shown between the first and second molars. The ossistructure on the buccal surface is very heavy compared with that on the lingual surface.

In Fig. 332 are shown two radiograms of an impaction of the second and third molars, where Fig. 332 A is a lingual view and Fig. 332 B is an occlusal view of the same case.

In Fig. 332 A there is an overlap of a part of the occlusal surface of

A B

Fig. 332. — Impacted Second and Third Molars. Same case where second and third molars are impacted. *A*, lingual view; *B*, occlusal view.

the second molar upon the distal root of the first, but there is no overlap of the mesial surface of the third molar upon the distal surface of the first. The occlusal surface of the second molar is slightly visible, but no part of the occlusal surface of the third molar is shown. The mesial surface of the second molar is inaccessible, but the mesial surface of the third molar is accessible. The ossistructure is at the gingival third of the third molar and extends over the entire second molar, with the exception of a small part of the distal surface.

In Fig. 332 B on account of the character of the deflection of both teeth, one superimposed upon the other, no positive definition can be made of the deflection of the third molar, although the second molar shows a slight buccolingual deflection. No positive definition can be obtained of the ossistructure on the buccal and lingual surfaces of the second and third molars.

CHAPTER XIV

Instruments

THE question that very naturally presents itself to an operator when considering the extraction of an impacted mandibular third molar is the particular design of instrument to use for the contemplated operation. This question can be more readily answered if the type of impaction to which the case belongs has been previously determined by a proper clinical examination and radiographic interpretation. Only too frequently the design of the instrument to be used becomes the paramount question instead of deciding that point by a preliminary diagnosis. It is to be admitted that the instrument to be used is an important factor in the procedure, but of equal, if not of greater, importance is the preliminary diagnosis to indicate the operative technic to be followed.

The anatomic formation of the tooth, its abnormal position, the structure to be used as a fulcrum and the necessary excision of ossistructure have a bearing on the design of the instruments to be employed in the extraction of an impacted mandibular third molar. In addition to these considerations are the important features of the accessibility and adaptability of the instruments, their proper application, their cutting qualities and the tractive and leverage power of which they are susceptible for the purpose of extraction.

Failure to obtain ideal operative results may follow the use of an incorrectly designed instrument, and, on the other hand, failure may be the result of a correctly designed instrument that is improperly applied. It is therefore essential for the operator, in order to obtain the best results, to know which instruments to select for any particular operation, to be familiar with their use under the conditions presented and to understand a definite technic for the extraction of the contemplated impacted tooth. Illustrations are shown of instruments that have proved to be efficient for the extraction of various cases of impacted mandibular third molars that may be presented. These illustrations are produced in actual sizes of the instruments, with complete descriptions. The instruments consist of exolevers and ossisectors of various designs such as are used in conjunction with the operation.

EXOLEVER

The exolever is an instrument, the use of which the operator should thoroughly familiarize himself, as a knowledge of its proper application and the exolever movements to be made with it are most important to

execute successfully the operative technic described. Some operators not accustomed to the use of the exolever may consider the instrument cumbersome and difficult to apply, and may feel that the possibility of its slipping from its adjustment on a tooth is too hazardous to attempt its application. However, if the exolever is properly applied, better results can be obtained with it than with forceps or any other instrument designed at the present time for the execution of the initial movements and final extraction of an impacted mandibular third molar from its socket, provided the proper excision of ossistructure has been made in advance. In order that the operator may, when learning to use the exolever for operations on impacted mandibular third molars, have a clear conception of its applicability and value, and at the same time acquire a certain degree of preliminary proficiency with the instrument, it is suggested that he make a test of the practical utility of the exolever by developing his skill on teeth that are not impacted. Exolever No. 1L, 1R or No. 2L, 2R should be used for the extraction of the mandibular third molar when not impacted, and exolever No. 11L, 11R; No. 12L, 12R or No. 13L, 13R should be used for the extraction of the roots of the mandibular first, second and third molars, as described in "Exodontia," published in 1913.

As mentioned above, there is always the hazard with any instrument used in the oral cavity of a mishap occurring, such as the instrument slipping from its adjustment, and this is true of any operative procedure in the mouth.

Exolever Handle.—The shape of the handle of an exolever is of greater significance as a factor for efficient execution than has usually been ascribed to it, but particularly important is the shape of the handle of an exolever used in the extraction of an impacted mandibular third molar. In the use of an exolever for such a purpose, certain mechanical principles of power are employed, as, for example, direct pressure and leverage at various angles; and, in order to obtain the best results with the instrument, not only must the particular shape of the blade and shank be applicable for the case presented, but the handle must be of such conformation as to enable the operator to execute the necessary movements for extraction with comparative ease and absolute precision.

The handle of the exolever for the extraction of an impacted tooth has been specially designed for the particular condition for which it is indicated, and is intended to facilitate the application of the necessary force to extract the tooth with as little trauma as possible, whether in the case of applying direct pressure or leverage, or excising the ossistructure.

Some years ago the writer, when developing a technic for the extraction of the roots of the mandibular first molar, in cases where the exolever is indicated, employed various kinds of handles, and found that there was a lack of control at the psychologic moment when control was the paramount factor. A thorough investigation was made of the problem of control, and it was demonstrated that the principle of control in the antiquated "key" was inherent in the handle attached to that instrument. Although the method of applying the "key" was very destructive to the supporting ossistructure, the handle of that instrument nevertheless possessed the principle of control. The handle of the exolever was therefore modified, and the blades were designed to conform to the anatomic arrangement of the tooth and the structure that was to be used as a fulcrum. The author found that the best results could be obtained where the exolevers designed for the extraction of impacted mandibular third molars and for ossisectors with which to excise the ossistructure were supplied with the "T" handle.

Exolever Shank.—The shank of the exolever should be so constructed that the operator will be able to apply properly the instrument to the various positions that may be assumed by the impacted third molar, so that when leverage with the exolever for extracting the tooth is applied, the shank will be an aid in the operative procedure. As the third molar is located in the extreme posterior part of the oral cavity, and as the cheek may in some cases offer interference, especially in the case of a small mouth, the shank should not be too bulky, so that the instrument can be applied with facility. The shank should, however, be constructed strong enough to withstand any strain that may be applied to it. A great deal of study has been given to designing the shank, since the access to be obtained in the region of the mandibular third molar is very limited, and as great an advantage as possible should be had with the shank in order to make it accessible and efficient for its purpose.

Exolever Blade.—The blade of the exolever should be shaped in such a way that it may be properly applied to the various positions that may be presented by the impacted mandibular third molar, so that, when leverage or pressure is exerted, the blade will not slip from its adjustment upon the tooth or fulcrum and interfere with the extraction movements. It is necessary that the blade be properly adapted for the various positions in order that a definite technical procedure may be followed. The style of blades illustrated is based on the results of practical experience and is designed to conform to the anatomy of the third molar and the structure to be utilized as a fulcrum.

EXOLEVER FOR MESIAL APPLICATION

Exolever No. 1L, 1R.—In order that the operator may become proficient in the extraction of the mandibular third molar when impacted in a vertical position, the use of exolever No. 1L or 1R (Fig. 333) should be thoroughly mastered.

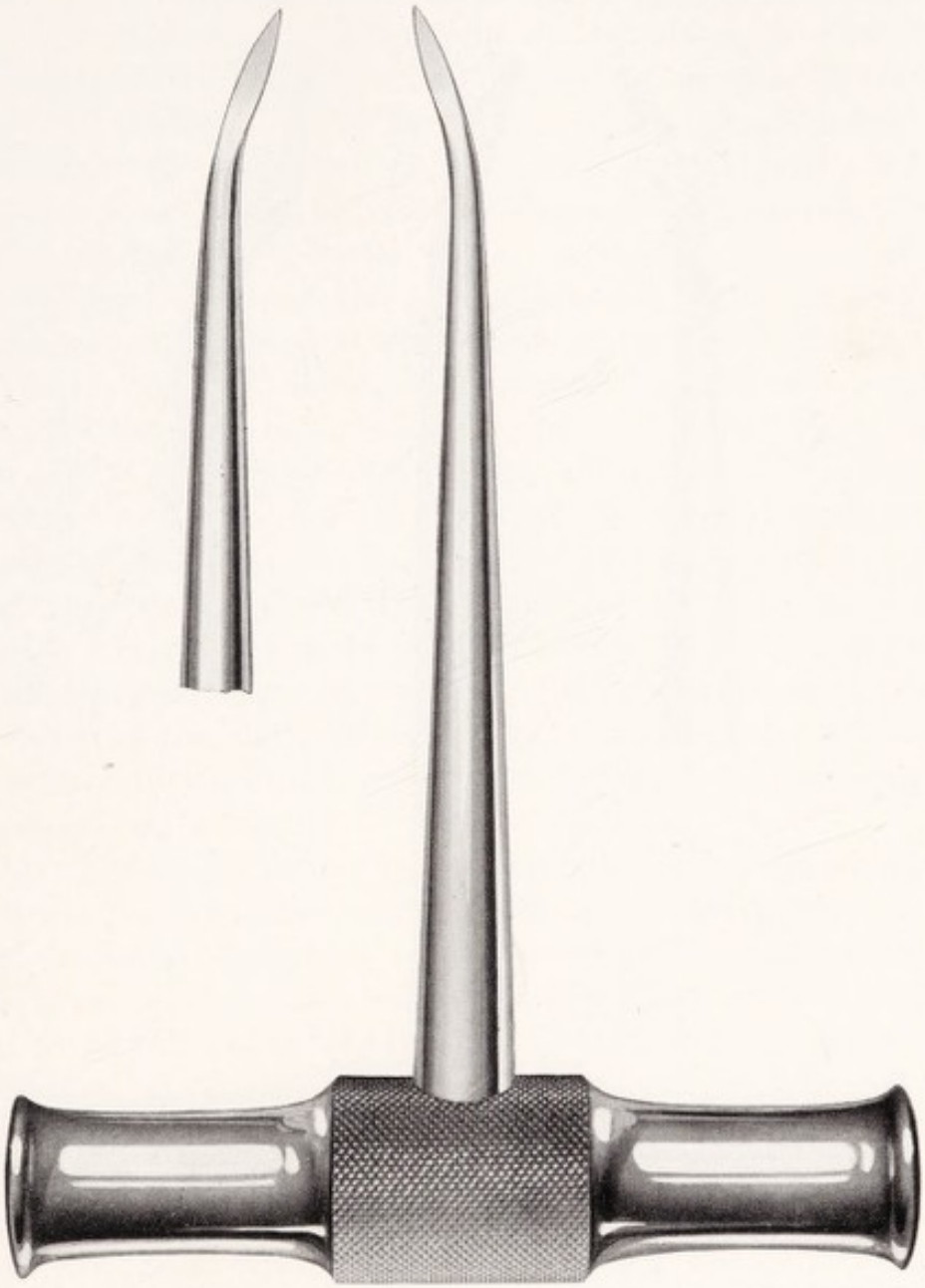


Fig. 333. — Exolever No. 1L, 1R. Indicated for vertical type of impaction; mesial application.

If the operator has any doubt of his ability to execute properly the exolever technic for the extraction of the mandibular third molar when impacted, he can become more proficient in the use of this exolever in those cases where the extraction of the mandibular third molar when not impacted is indicated and the tooth is in an approximately normal position.

The use of this exolever for the extraction of the mandibular third molar, whether impacted or in an approximately normal position, is far superior to the use of the physic or other forceps, and, when its use for this purpose has been properly acquired, the technic for the extraction of the mandibular third molar, in an approximately normal position or impacted, can be executed in an adept manner.

Fig. 334. — Exolever No. 2L, 2R. Indicated for vertical, mesioangular and horizontal types of impaction; mesial application.

The application of the exolever is made with the flat side against the mesial surface of the third molar and the round side against the superior border of the ossistructure, the latter structure being utilized as a fulcrum.

Exolever No. 2L, 2R.—In a vertical type of impaction where both roots are inclined distally and it is impracticable to direct the tooth

distally with exolever No. 1L or 1R to a distance in conformity with the root formation, an exolever is indicated that can be adjusted to the greater part of the mesial surface of the crown in order to utilize the ossistructure and the distal surface of the second molar as a fulcrum, in which instance exolever No. 2L or 2R (Fig. 334) is indicated. Where the mandibular third molar is impacted in a mesioangular position, the alignment of the mesial surface is at an angle compared with the vertical alignment of the distal surface of the second molar. Where the third molar is impacted in a horizontal position, the alignment of the mesial surface is in a horizontal position compared with the vertical alignment of the distal surface of the second molar. In order to gain access to the mesial surface with an exolever that will conform to the angulation of this surface in a mesioangular impaction, and to the horizontal alignment of the mesial surface in a horizontal impaction, the exolever used for a mesial application in the routine types of vertical impaction was found unsatisfactory on account of the alignment of the mesial surface and the increased difficulty of access. It was necessary to design an exolever with a different bend in the shank in order to apply the instrument to the mesial surface without injury to the corner of the mouth, and, at the same time, in order that the power of the lever would not be lost. It was found necessary to bend the shank of the exolever for the left and right sides in order to reach the mesial surface of the third molar on account of the variation in the alignment of this surface.

The instrument is used (1) in vertical, mesioangular and horizontal types of impaction where there is no deflection; (2) where there is a lingual deflection of the tooth; (3) occasionally where there is a buccal deflection after the tooth has been directed to a distance to permit its application, and (4) where the third molar is in an isolated position, after the tooth has been directed upward and distally to a point where the superior border of the ossistructure can be utilized as a fulcrum.

Where there is a buccolingual deflection, this instrument is often used after the tooth has been directed distally from its contact with the distobuccal surface of the second molar with an exolever of a different design, and, in some of these cases, especially the horizontal type, the initial application is made with this instrument. The blades have been designed to meet such conditions as the variation in the size of the crown; the variation in the size of the interseptum between the mesial surface of the third molar and the distal surface of the second molar; the superior border of the ossistructure as related to the mesial surface; the involvement of the ossistructure

by pathologic changes, and the relation of the mesial surface of the impacted tooth to the second molar.

This exolever is especially indicated for the preliminary application in a case where there is only a small space available for access.

Fig. 335. — Exolever No. 3L, 3R. Indicated for vertical, mesioangular and horizontal types of impaction; mesial application. Similar to No. 2L, 2R, except that there is an increase in size of blade.

This exolever is also indicated where the mesial surface is involved by caries, where only the roots remain and there is a small part of the mesial surface of the mesial root available for the application of a small blade, and in cases where the third molar is not impacted.

Exolever No. 3L, 3R.—Where the space between the mesial surface of the third molar and the structure to be used as a fulcrum is

such that exolever No. 2L or 2R would be too small, or, after the tooth has been directed distally with the exolever designated above, if the fulcrum is too far away and the power of the lever is lost, exolever No. 3L or 3R (Fig. 335) is then indicated. This instru-

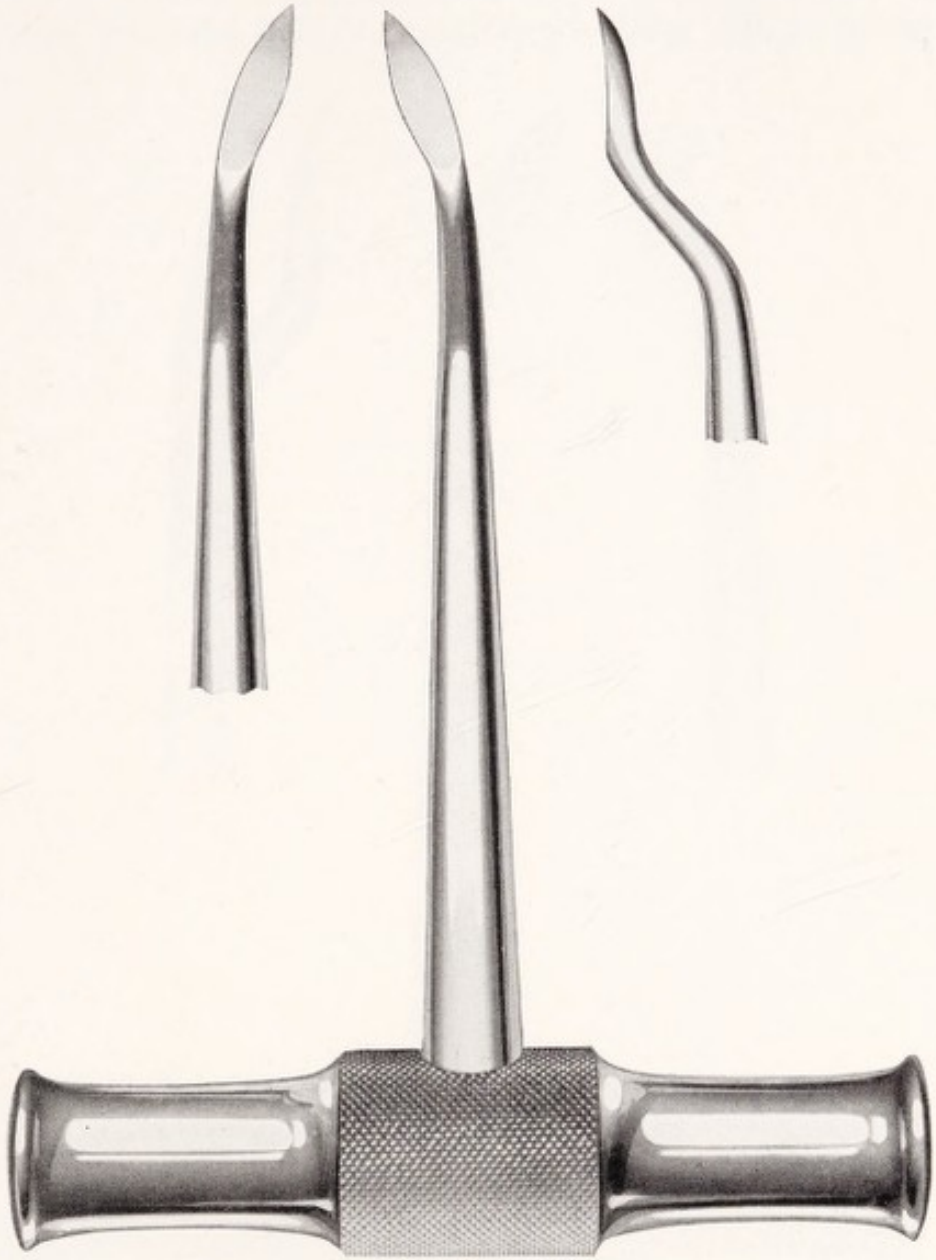


Fig. 336. — Exolever No. 4L, 4R. Indicated for mesioangular and horizontal types of impaction; mesial application. Similar to No. 2L, 2R; No. 3L, 3R, except that there is an increase in width of blade.

ment is similar in design to No. 2L and 2R, except that there is an increase in the size of the blade.

Exolever No. 4L, 4R.—Where the impacted tooth is in a mesioangular or horizontal position and has been directed upward and distally with exolever No. 2L, 3L or No. 2R, 3R to a point where the fulcrum between the mesial surface and the ossistructure below this surface has been lost on account of distance, or there has been,

by the application of the instruments, a further destruction of the ossistructure used as a fulcrum, and, in such cases where there is an extensive pathologic involvement below the mesial surface of the tooth, exolever No. 4L or 4R, illustrated in Fig. 336, has been designed for such cases. The blade has been shaped to conform to the position of the tooth when it is directed partially upward and

Fig. 337. — Exolever No. 5L, 5R. Indicated for mesioangular and horizontal types of impaction; mesial application. Similar to No. 4L, 4R, except for increased size of blade.

distally, and is especially indicated where there is quite a distance between the fulcrum and the mesial surface. The shank has been bent to conform to the corner of the mouth, and the blade has been designed to gain access to the mesial surface.

Exolever No. 5L, 5R.—Where the impacted tooth is in a mesioangular or horizontal position and there is a large space between

the mesial surface and the superior border of the ossistructure, or, after the tooth has been directed distally and upward with exolever No. 2L, 2R; No. 3L, 3R; or No. 4L, 4R to a point where the fulcrum is lost to such an extent that it cannot be later utilized with one of these exolevers, an instrument with a larger blade is then indicated, and exolever No. 5L or 5R (Fig. 337) has been especially designed

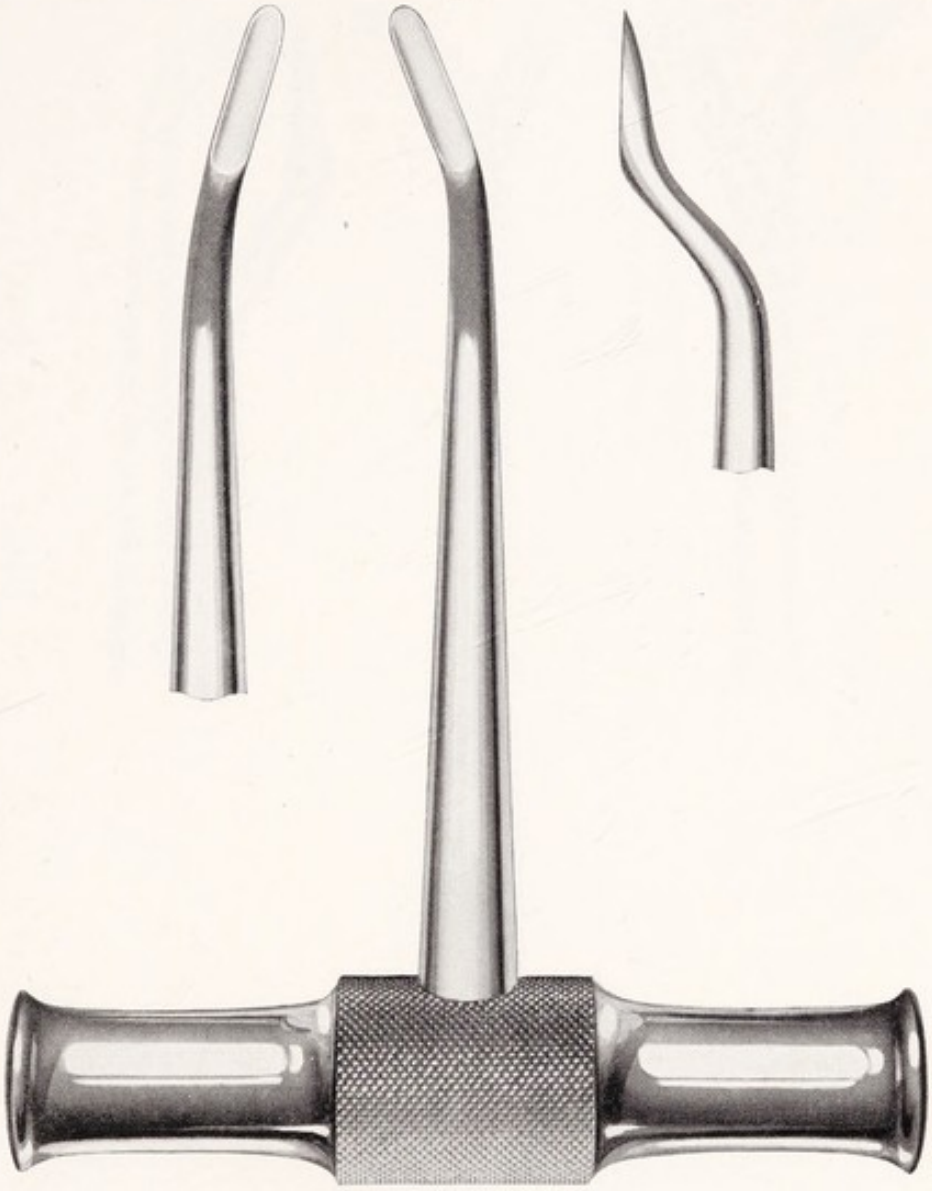


Fig. 338. — Exolever No. 6L, 6R. Indicated for vertical, angular and horizontal types of impaction; mesial application where there is a buccal deflection.

for this purpose. This instrument is similar in design to No. 4L, 4R, except that the blade is larger.

Exolever No. 6L, 6R.—Where the impacted mandibular third molar is deflected buccally, in most cases, the exolever blade cannot be successfully applied between the mesial surface of the third molar and the distal surface of the second molar in order to use the latter tooth as a fulcrum, and the adjustment is made to that part of the

mesial surface of the crown that is deflected buccally out of alignment with the distobuccal surface of the second molar, and the ossistructure anterior to and below that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, is used as a fulcrum. In this type of case exolever No. 6L or 6R, illustrated in Fig. 338, is indicated to direct

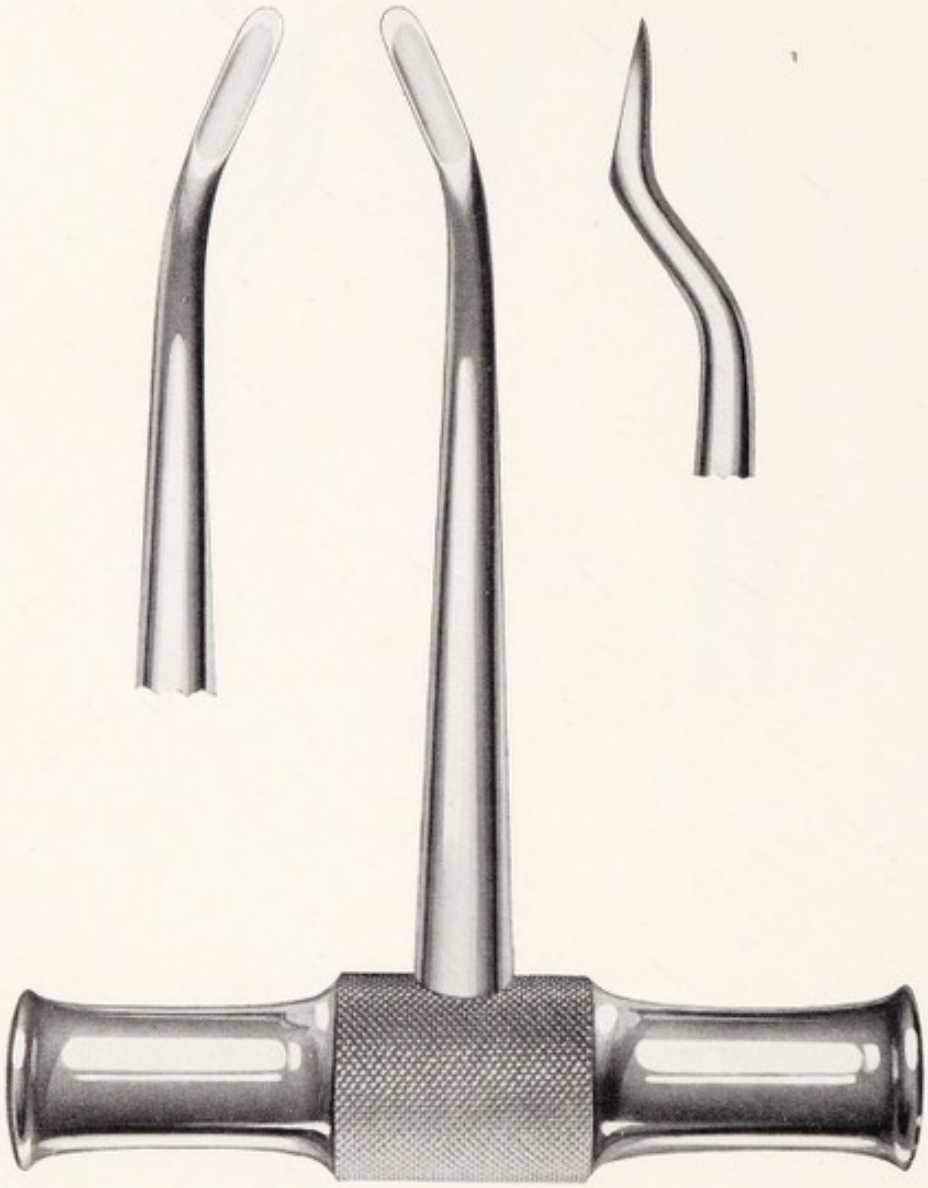


Fig. 339. — Exolever No. 7L, 7R. Indicated for horizontal type of impaction; mesial and mesiobuccal applications.

the crown of the third molar upward and distally. As the surface of the third molar, which is available for the application of the exolever blade, is in close contact with the distobuccal surface of the second molar, the blade has been designed so as to fit that part of the deflected crown, and at the same time not endanger the second molar. The shank has been bent to conform to the corner of the mouth and the blade has been designed to permit access to that part

of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar.

The blade of this instrument has been designed in the form of a wedge so that when it is adjusted to that part of the mesial surface of the crown which is deflected buccally out of alignment with the distobuccal surface of the second molar, and pressure is applied

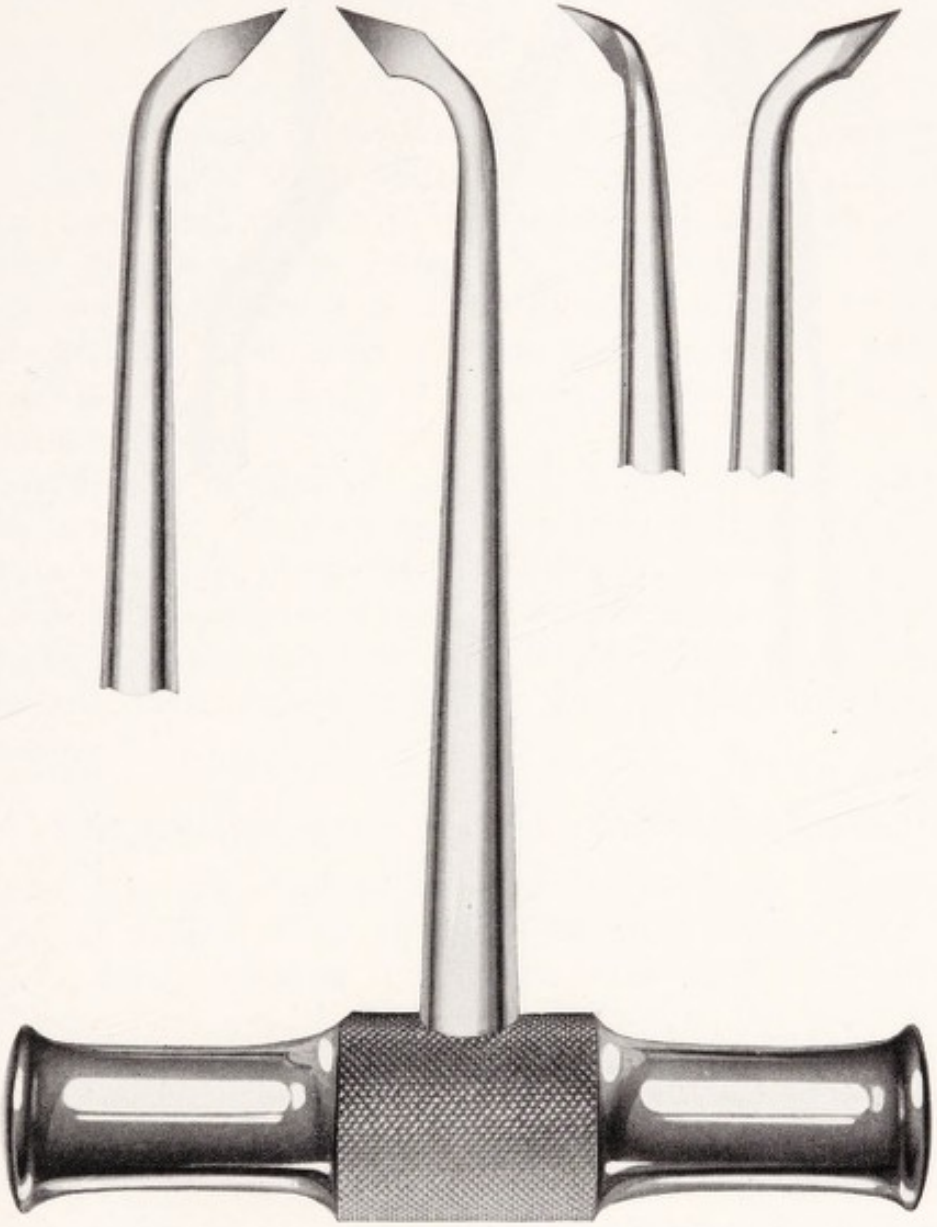


Fig. 340. — Exolever No. 8L, 8R. Indicated for isolated mesioangular and horizontal types of impaction; mesial application.

to the handle, the wedge created between the tooth and the ossi-structure is often sufficient to extract the tooth.

Exolever No. 7L, 7R.—Where the mandibular third molar is impacted in a horizontal position and there is a buccal or a buccolingual deflection, if, after the tooth has been partially directed upward and distally with exolever No. 2L, 2R or No. 3L, 3R and this instrument does not meet the condition on account of the character of the

deflection, and also in those cases of horizontal impaction where the greater part of the buccal surface is free of ossistructure, exolever No. 7L or 7R (Fig. 339) is then indicated. This instrument has been designed for those cases where the external oblique ridge is in close proximity to the buccal surface and can be used as a fulcrum.

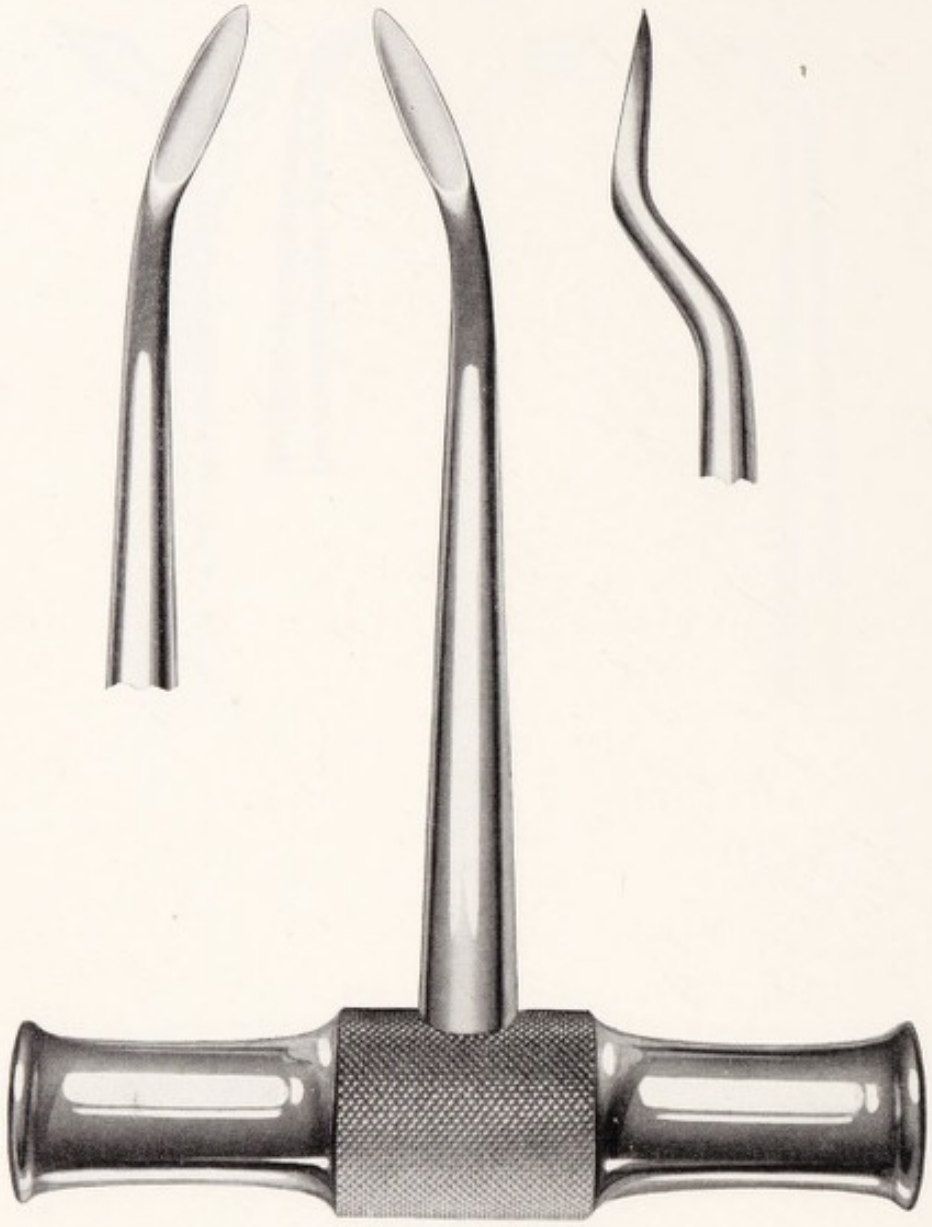


Fig. 341. — Exolever No. 9L, 9R. Indicated for vertical and distoangular types of impaction; mesiobuccal application.

Exolever No. 8L, 8R.—Where the mandibular third molar is isolated and impacted in a mesioangular or horizontal position, the second molar is not available as a fulcrum. In such a case the exolever is adjusted to the greater part of the mesial surface of the crown, the ossistructure anterior to and below this surface being utilized as a fulcrum. Exolever No. 8L or 8R, illustrated in Fig. 340, is indicated.

The blade has been designed to accommodate the variations in the size of the crowns of the third molar. The blade is tapered to a cutting edge, and this is quite an advantage, as it can be used to excise the ossistructure, when indicated, and often penetrates the mesial root.

EXOLEVER FOR MESIOBUCCAL APPLICATION

Exolever No. 9L, 9R.—In cases where the mandibular third molar is impacted in a vertical position and is deflected lingually or buccolingually; also in cases of vertical and distoangular impaction where there is quite a large space between the mesial surface of the third molar and the distal surface of the second molar, and in such cases of vertical or distoangular impaction where there is a contact of the mesial root of the third molar with the distal root of the second, the application of the exolever blade is made to the mesiobuccal surface of the third molar, and exolever No. 9L, 9R, illustrated in Fig. 341, is indicated.

The exolever is designed to conform to the variations in the distance for access to the mesiobuccal surface, and to take advantage of the ossistructure along the mesiobuccal surface as a fulcrum. This exolever is especially designed for cases where the second molar is not to be used as a fulcrum. The length of the shank for the left side has been increased ¼ inch over that for the right side to improve access.

EXOLEVER FOR BUCCAL APPLICATION

Exolever No. 10L, 10R.—The application of the exolever blade to the buccal surface of the crown of the third molar at the bifurcation of the roots, utilizing the ossistructure on the buccal surface as a fulcrum, has been the means of improving the technic for the extraction of the mandibular third molar when impacted. Exolever No. 10L, 10R, illustrated in Fig. 342, is indicated for this purpose.

The wedge power of this instrument, when applied to the buccal surface of a mandibular third molar at the bifurcation of the roots—whether the tooth is in approximately normal alignment or impacted—is of such force as to make the instrument a factor of special consideration, and its effectiveness depends on its correct application and subsequent proper manipulation.

The wedge power is acquired by inserting the point of the blade at the bifurcation between the buccal surface of the third molar and the ossistructure on this surface. When this insertion has been accomplished, a wedge is created and often the initial application releases the tooth. If the wedge movements fail to extract the

tooth, the operator then tilts the handle of the exolever to a slight extent buccally (that is, toward the cheek), using the superior border of the ossistructure as a fulcrum, which movement should raise the tooth out of the socket. If any unusual resistance is encountered when making this movement, the wedge power of the instrument

Fig. 342. — Exolever No. 10L, 10R. Indicated for vertical, mesioangular, distoangular and horizontal types of impaction; buccal application.

can be increased by sending the blade farther down into the bifurcation and increasing the pressure.

The principle of the exolever may be likened to inserting a hook into the bifurcation of the tooth and making an upward tractive movement in line with its long axis. The application of the instrument, by inserting the blade into the bifurcation, using the superior border of the ossistructure as a fulcrum and tilting the handle for

an upward tractive movement, involves practically the same principle of force as the antiquated "key" with which an adjustment was made on the lingual surface of the tooth, while the ossistructure on the buccal surface was used as a fulcrum, followed by a more or less circular tractive movement. With this exolever, however, a full-

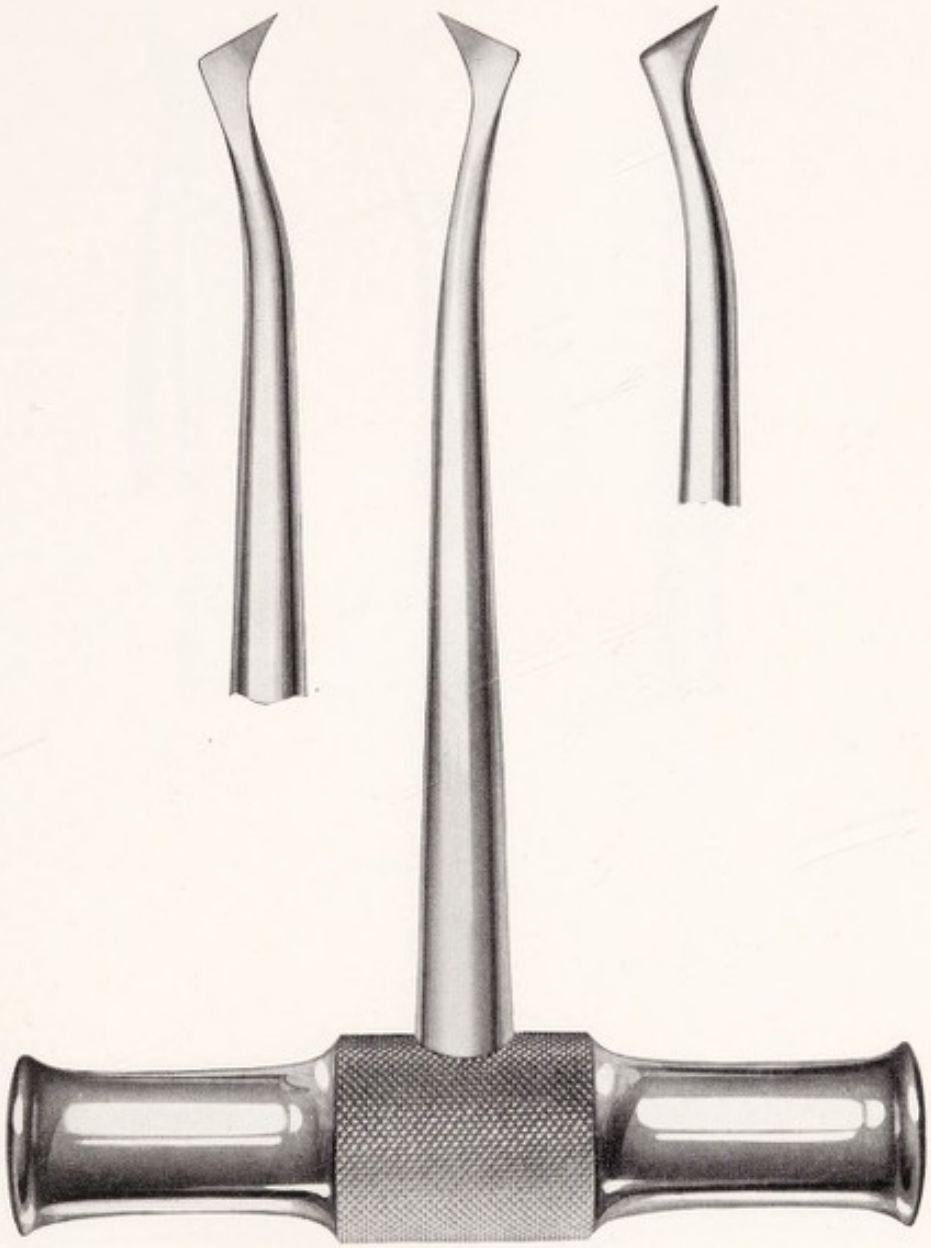


Fig. 343. — Exolever No. 11L, 11R. Indicated for isolated vertical type of impaction and for the extraction of roots; mesial, mesiobuccal and buccal applications.

circle movement is not made and the tooth is directed upward with this instrument in line with its axis. The ossistructure on the buccal surface is an ideal fulcrum and no injury is done to this surface as was the case when using the antiquated "key," as the back of the blade is designed in a manner to conform with the buccal ossistructure and not lose its efficiency when the tooth is elevated.

EXOLEVER FOR MESIAL, MESIOBUCCAL AND BUCCAL APPLICATIONS

Exolever No. 11L, 11R; No. 12L, 12R; or No. 13L, 13R.—Where the mandibular third molar is impacted in a vertical, mesioangular or distoangular position, and part of the mesial surface of the crown is

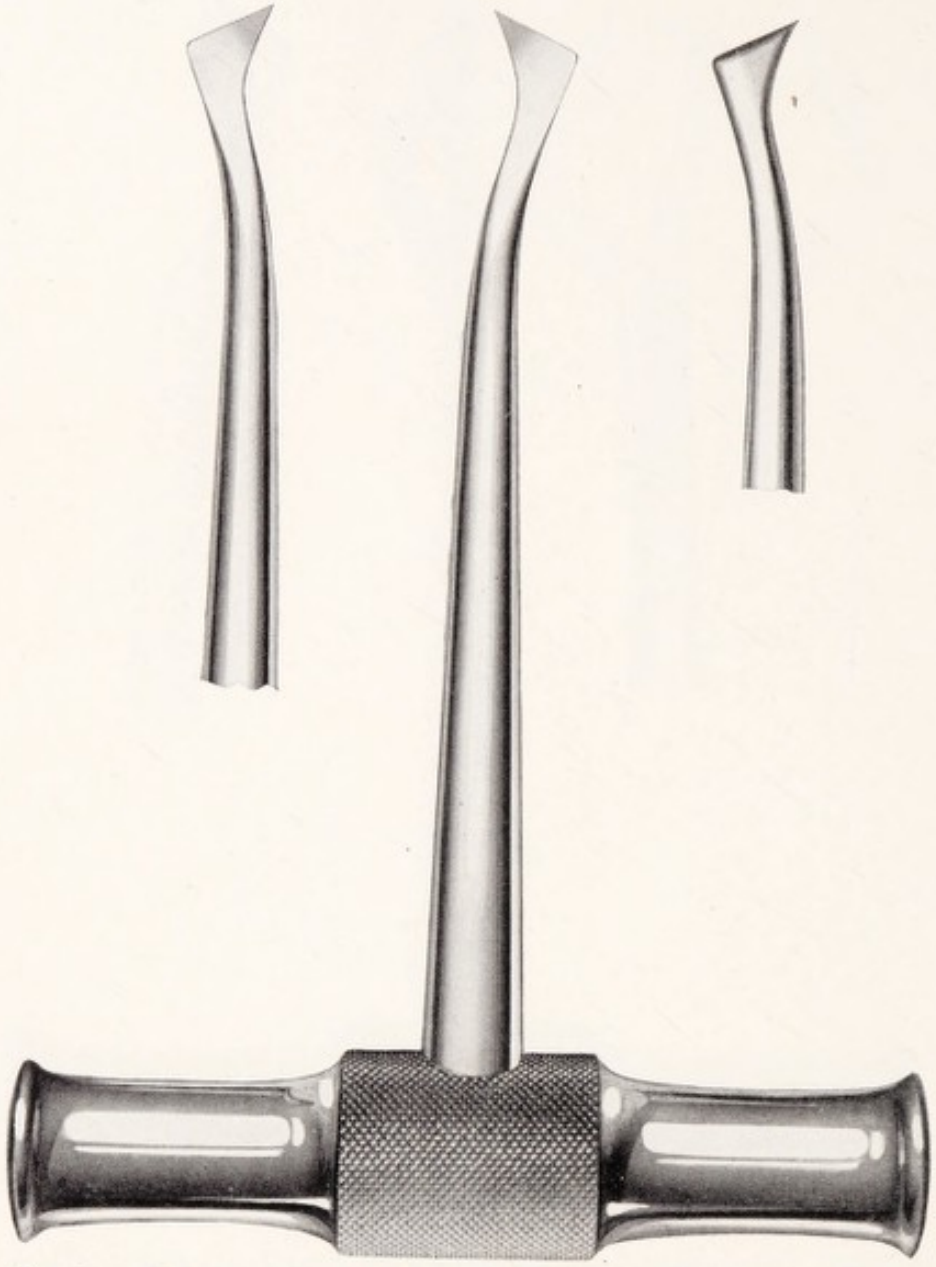


Fig. 344. — Exolever No. 12L, 12R. Indicated for isolated vertical type of impaction and for extraction of roots; mesial, mesiobuccal and buccal applications. The blade is slightly larger than that on exolever No. 11L, 11R (Fig. 343).

deflected buccally out of alignment with the distobuccal surface of the second molar, and in those cases of impacted mandibular third molar where the roots remain, exolever No. 11L, 11R; No. 12L, 12R; or No. 13L, 13R, illustrated in Figures 343, 344 and 345, is indicated. The exolever is made in sets of three pairs, with three sizes of blades respectively.

The different sizes of the blades have been designed to conform with the various sizes of the mesial, mesiobuccal or buccal surface of the crown of the third molar available for the application.

In some cases the blade is applied to that part of the mesial surface of the crown that is deflected out of alignment buccally with

Fig. 345. — Exolever No. 13L, 13R. Indicated for isolated vertical type of impaction and for extraction of roots; mesial, mesiobuccal and buccal applications. The blade is slightly larger than those on No. 11L, 11R or No. 12L, 12R (Figs. 343, 344).

the distobuccal surface of the second molar. There are cases, however, where the blade is adjusted to the mesiobuccal surface, and other cases where it is adjusted to the buccal surface at the bifurcation. When extracting roots the adjustment may be made on the mesial, mesiobuccal, distal or buccal surface at the bifurcation. This instrument may also be used for splitting the roots at the bifurcation,

or extracting the mesial or distal root. Proficiency in the use of this exolever can be acquired when extracting the mandibular first, second or third molar, when not impacted, especially in those cases where only the roots remain.

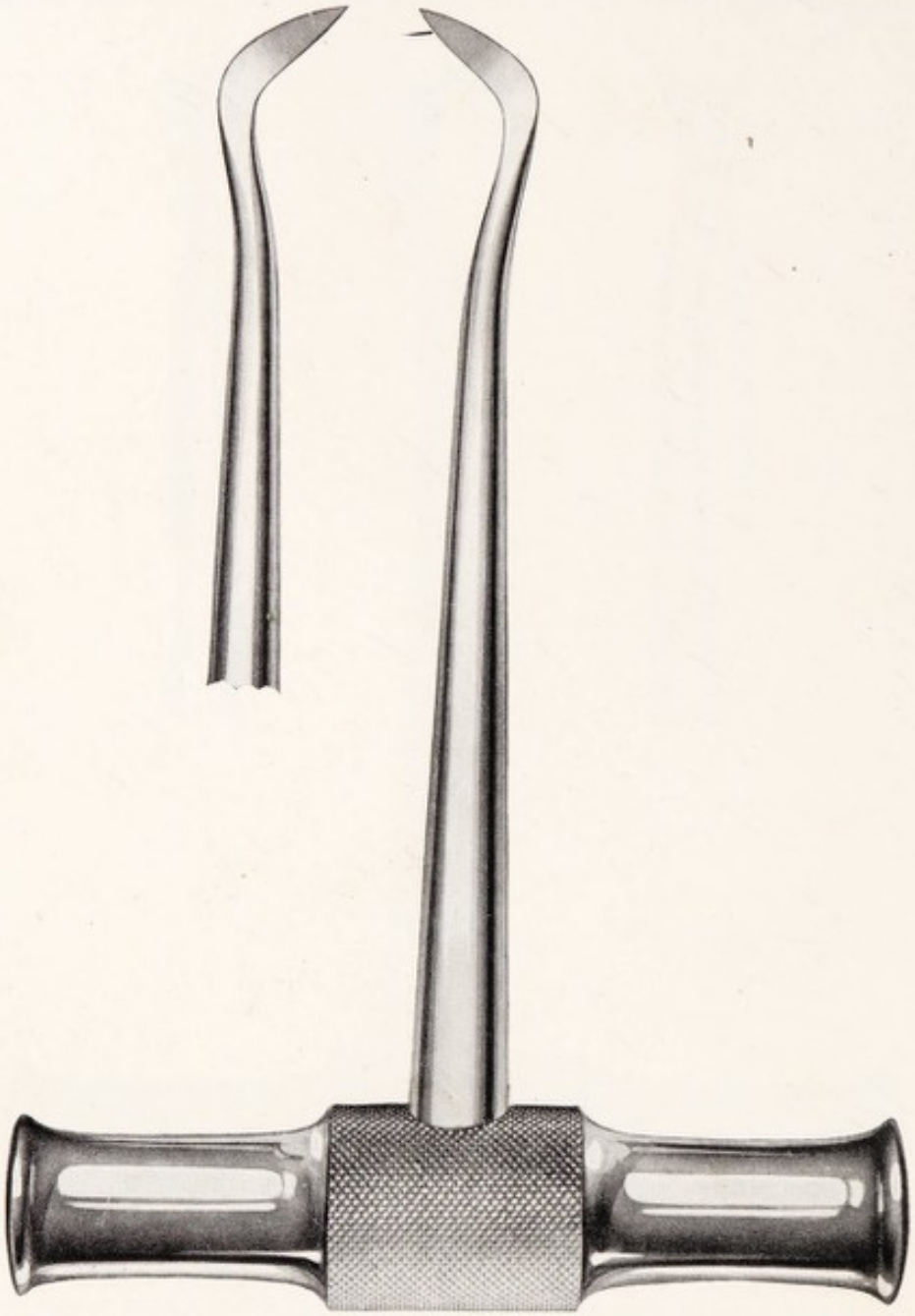


Fig. 346. — Exolever No. 14L, 14R. Indicated for extraction of small root fragments.

The application of the blade of this instrument should be carefully made. The force of leverage to be used, and the extraction movements to be executed, should be judiciously considered. An incorrect adjustment or an improper turning of the handle, due to lack of proper consideration of the anatomic formation or position of the tooth to be extracted, predisposes a fracture of the tooth or the breaking of the

blade of the instrument. Where breaking of the blade has occurred, when used for extraction, the break may be attributed to imperfect construction, but in all probability the cause was faulty technic.

SOCKET EXOLEVER

Exolever No. 14L, 14R.—Where the fracture of a root or roots occurs at the time of the operation, or where a root or roots remain as the result of a previous attempt to extract the impacted tooth, and

A

B

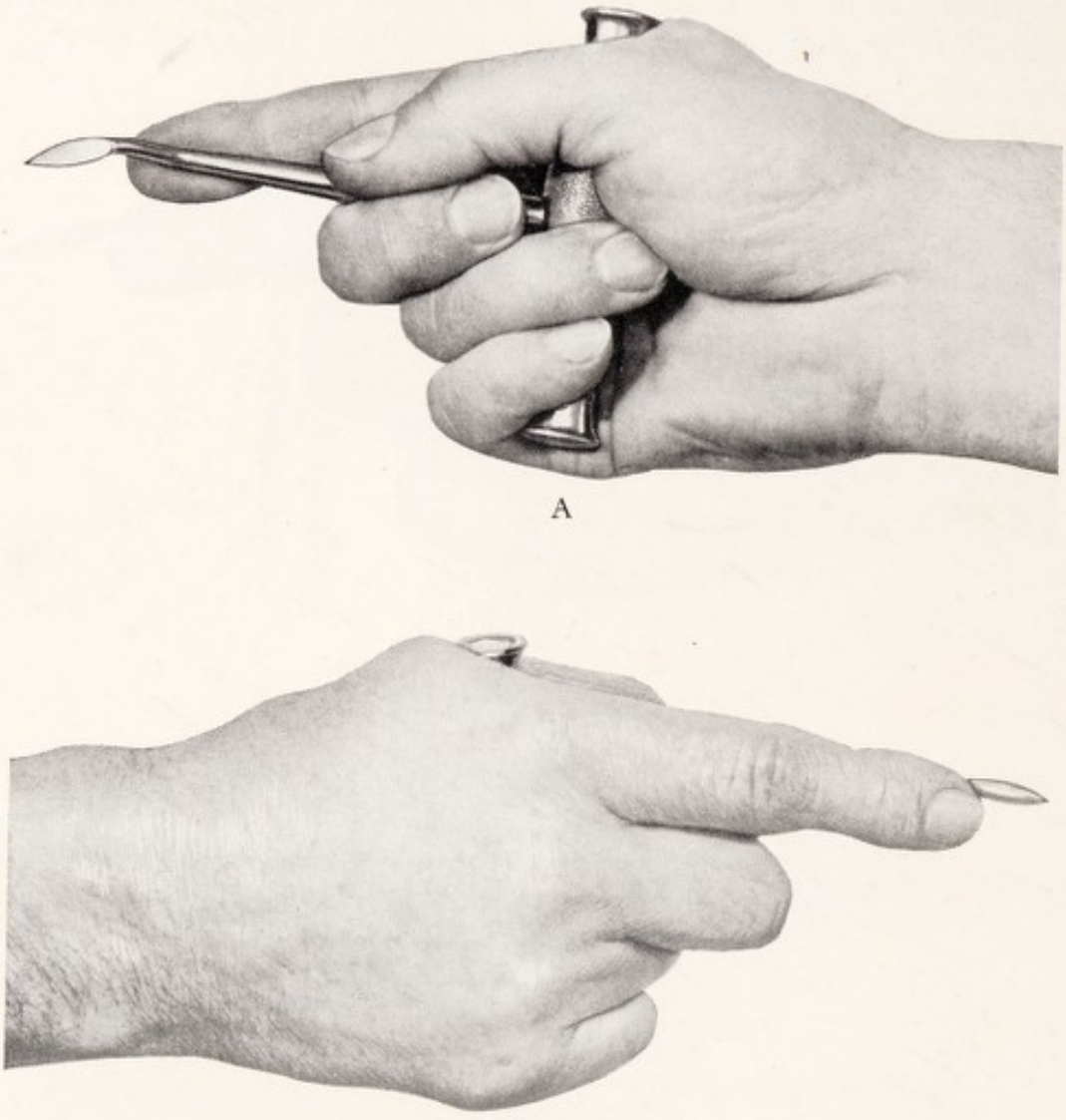
Fig. 347. — Holding Exolever—Left Side. Manner of holding properly an exolever (in this case exolever No. 3L, shown in Fig. 335) for making application on left side of arch. *A*, flat side of blade, which is to be applied to mesial surface; *B*, rounded side, which is to be adjusted to ossistructure to be used as a fulcrum.

access is not possible with the previously mentioned exolever, an instrument having a long narrow blade is used, and exolever No. 14L, 14R, illustrated in Fig. 346, is indicated.

This instrument is known as a socket exolever, and is made in pairs respectively for mesial or distal application. The blade is unusually

long, so that all parts of the socket can be reached with it, and was especially designed for removing any small apical ends of the root that may remain in a horizontal impaction.

Holding the Exolever.—The handle and shank of the exolever is formed so that it may be securely held in the hand, as shown in Fig. 347, where the instrument for the left side is shown, and in Fig. 348,



A

B

Fig. 348. — Holding Exolever—Right Side. Manner of holding properly an exolever (in this case exolever No. 3R, shown in Fig. 335) for making application on right side of arch. *A*, flat side of blade, which is to be applied to mesial surface; *B*, rounded side, which is to be adjusted to ossistructure to be used as a fulcrum.

where the instrument for the right side is shown. When making a buccal application on the left side the instrument is held as shown in Fig. 349.

OSSISECTOR

When indicated by a predetermination of the amount of ossistructure to be excised and the exact location for the excision, the excision of the ossistructure from the mesial, mesiobuccal, buccal, lingual or

distal surface, or over the occlusal surface materially reduces unnecessary excision in the location where excision is not indicated. In order to make the necessary excision it was found that instruments had to be designed for particular locations governing the character of the ossistructure in the location and the extent of excision necessary. The operator should make a study of the access to the part so that as little trauma as possible would follow, and, in addition, so that excision could be made directly toward the tooth, thus minimizing the liability of any accident.

Excision is made, as a rule, toward the impacted tooth, and in only a few types of impaction is this procedure impracticable. When a case is presented where excision toward the impacted tooth is not practicable, the excision is made as if it were a case of excising a ledge of

Fig. 349. — Holding Exolever—Left Side. Manner of holding properly an exolever (in this case exolever No. 10L, shown in Fig. 342) for making application on left side of arch where a buccal application is indicated.

ossistructure that may be over the occlusal surface in a lingual deflection, or as if it were a case of excising the ossistructure between the occlusal surface of the third molar and the distal surface of the second where the third molar is impacted in an angular or horizontal position.

Before the introduction of the ossisector, various methods of excising the ossistructure were attempted with the object of facilitating the extraction of the impacted third molar and decreasing the trauma that was usually associated with the operative procedure. All the instruments that were used at that time for excising the ossistructure, such as the surgical bur, long-handled chisel, more or less heavy mallet and other appliances, were included in the author's armamentarium. The difficulty of excising with any degree of precision and of preventing considerable trauma prompted the author to devise the ossisector to be described, which consists of a combination of blade, shank and handle, to be used by hand pressure. Several styles of blades, which were suggested by experiments on dry specimens, and whose adapt-

ability was subsequently verified by application to actual cases, have been designed to meet the requirements of the various conditions that may be presented in cases of impacted third molar. The use of the ossisector so reduced the postoperative complications usually accompanying the former method of "cutting away" the ossistructure that the shank was constructed in such a way that the instrument could be employed to gain access to all of the surfaces of the third molar.

Where excision of the entire external plate buccal to the third molar is followed as a routine procedure to facilitate the extraction of the tooth, the use of the ossisector is not practicable, as the ossistructure in this region is very dense, making excision extremely difficult, and, in order to reach the third molar, the excision must include part of the external oblique ridge. The distance between the external border of the mandible and the buccal surface of the third molar is often more than ¼ inch, and such an excision is done with considerable trauma and is not indicated.

As progress was made in differentiating the various types of impacted third molar, with the variation in alignment and the difference in the character of the supporting ossistructure, a definite procedure was arranged for the excision of the ossistructure in the various cases of impaction where the exolever technic is executed.

It may be well to state that the methods of excision in the various types of impaction described in this book are adapted only to cases where the exolever technic is followed.

The various styles of ossisectors have been constructed with the object of reducing trauma and conserving as much as possible of the ossistructure. Excision is usually made on the distal surface of the third molar, except where the ossistructure extends only up to the gingival third, or where pathologic changes have involved the ossistructure in this area to such an extent that no excision is necessary. Where the ossistructure on the distal surface is involved by pathologic changes, the tooth may be directed distally and upward, in conformity with the root formation, into the space created by the pathologic condition. Where the pathologic area has not, however, involved the ossistructure to such an extent as to obviate excision, the third molar can be directed into the space that will be created by excision on the distal surface. Ossisectors for the distal excision have been designed especially for this purpose.

Where access to the mesial or mesiobuccal surface cannot be obtained with an exolever on account of interfering ossistructure, excision on this surface is indicated and is executed in conformity with the character of impaction and alignment of the third molar with the second. Such excision is, as a rule, readily made, as access to the part

to be excised presents the only difficulty, and ossisectors have been especially designed for this purpose.

Where, in a vertical or an angular impaction, by the application of the exolever to the mesial surface of the third molar, the tooth has been directed distally and upward into the space created by the excision of the ossistructure on the distal surface, and the movements

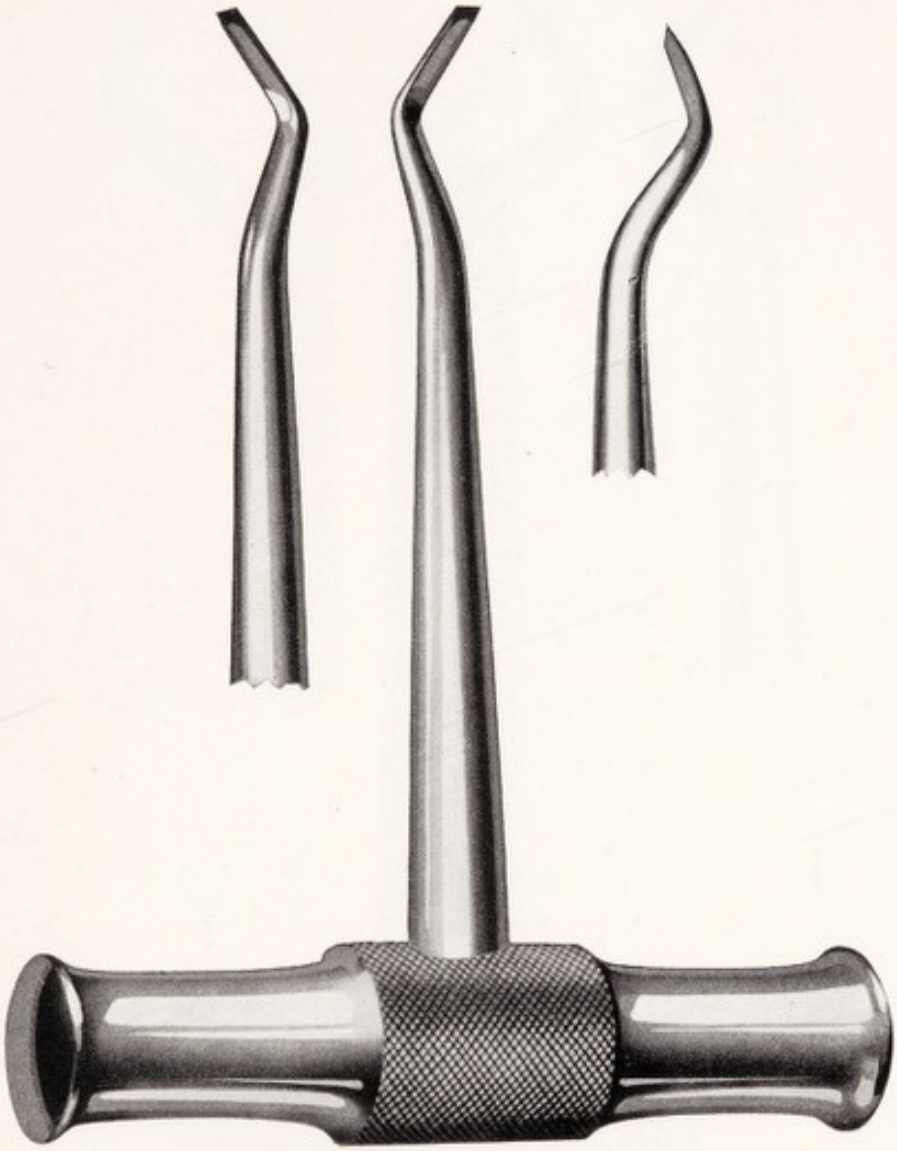


Fig. 350. — Ossisector No. 1L, 1R. Indicated for vertical type of impaction; distal excision.

distally cannot be continued on account of the liability of a fracture of the roots, and the exolever cannot be applied to the buccal surface at the bifurcation, excision on the buccal surface is then made, the extraction being completed by a buccal application of the exolever. Only sufficient excision is made on the buccal surface to permit the application of the exolever to this surface and to secure a suitable fulcrum. Ossisectors have been designed for excision on the buccal surface to gain access to this surface where a buccal application of the

exolever is indicated, and also for a limited buccal excision in a mesio-angular or horizontal impaction to reach the mesial surface. Where, in a complete lingual deflection, excision is indicated over the occlusal surface, and a direct excision cannot be made toward the third molar, the ossisector designed for a buccal excision is used for this purpose. Where excision of the ossistructure on the buccal surface is indicated

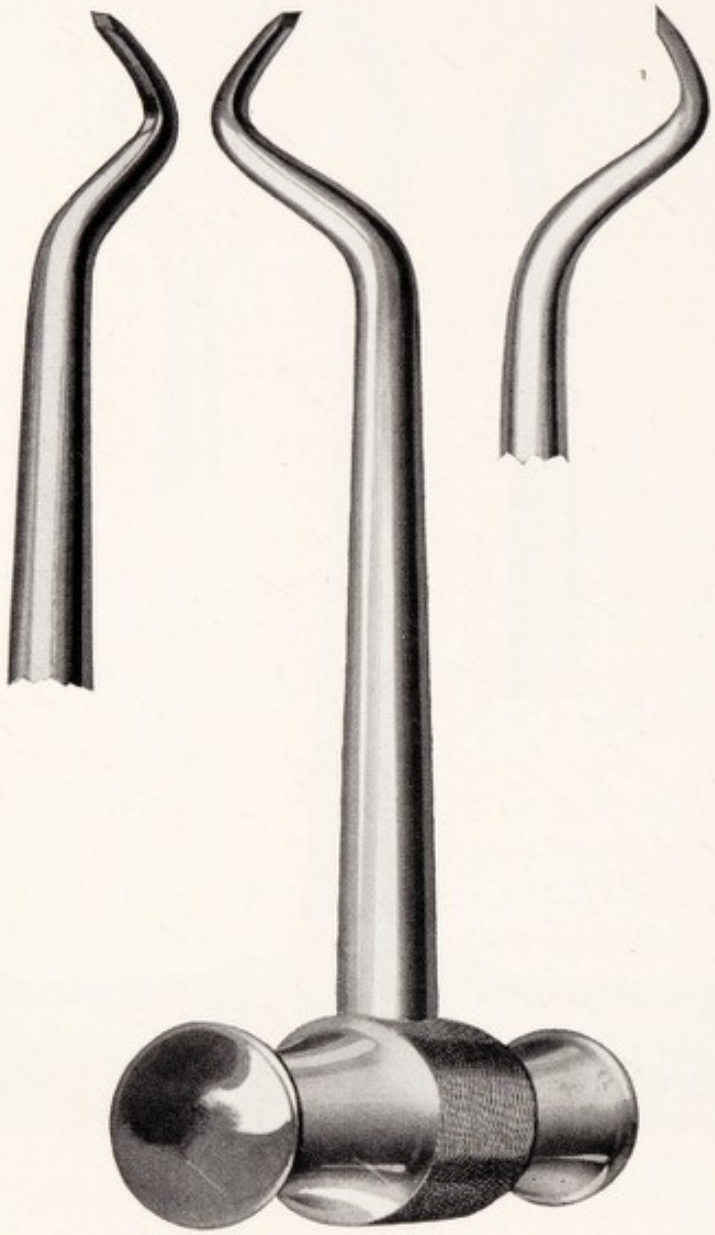


Fig. 351. — Ossisector No. 2L, 2R. Indicated for vertical, angular and horizontal types of impaction; distal excision.

to improve the fulcrum, the ossisector designed for a buccal excision wil serve this purpose.

OSSISECTOR FOR DISTAL EXCISION

Ossisector No. 1L, 1R.—In the majority of cases where the mandibular third molar is impacted in a vertical position, except where pathologic changes have extensively involved the ossistructure, or where

the ossistructure extends only up to the gingival third of the tooth, excision is indicated on the distal surface to permit the tooth to be directed distally and upward with an exolever. On account of the difficulty of access into the oral cavity, excision of the ossistructure on the distal surface, and the interference of the gum tissue over the occlusal surface, an instrument has been designed which will conform

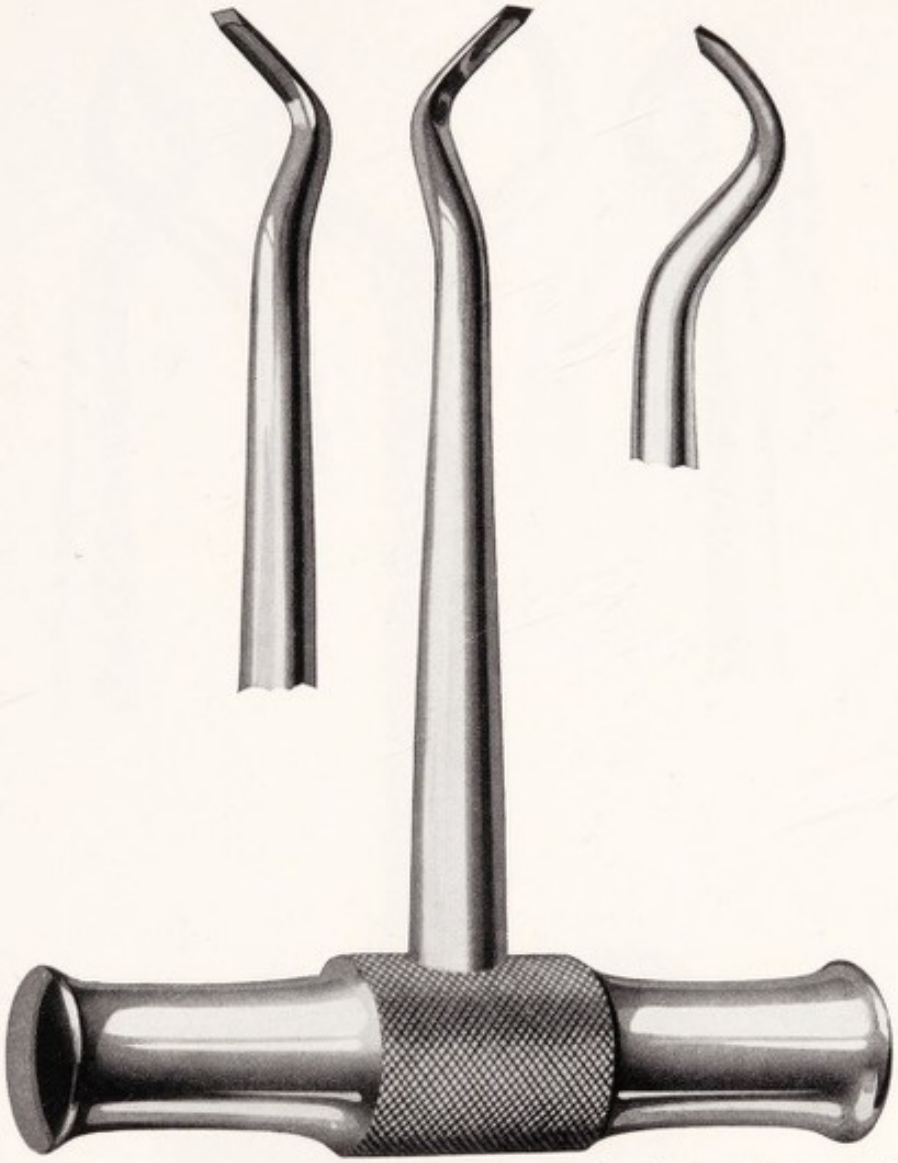


Fig. 352. — Ossisector No. 3L, 3R. Indicated for distoangular type of impaction; distal excision. Similar to No. 2L, 2R (Fig. 351) except for increase in length of blade.

to the conditions mentioned and permit excision to be made in a definite manner. Ossisectors No. 1L, 1R (Fig. 350) were designed especially for this excision, and it was found necessary to make one for each side. No. 1L is indicated for the left side of the arch and is used when the operator stands on the right side facing the patient and excises toward the distal surface.

Ossisector No. 1R is indicated for the right side, and is used when the operator stands to the rear of the patient and excises toward the

distal surface. The length of the shank of these instruments conforms to the distance for access, as there is a variation in the distance for access to the distal surface, and, in some extreme types of disto-angular impaction, a greater length in the shank is indicated, whereas in the majority of vertical, angular or horizontal impactions the length of the shank is not necessarily so great.

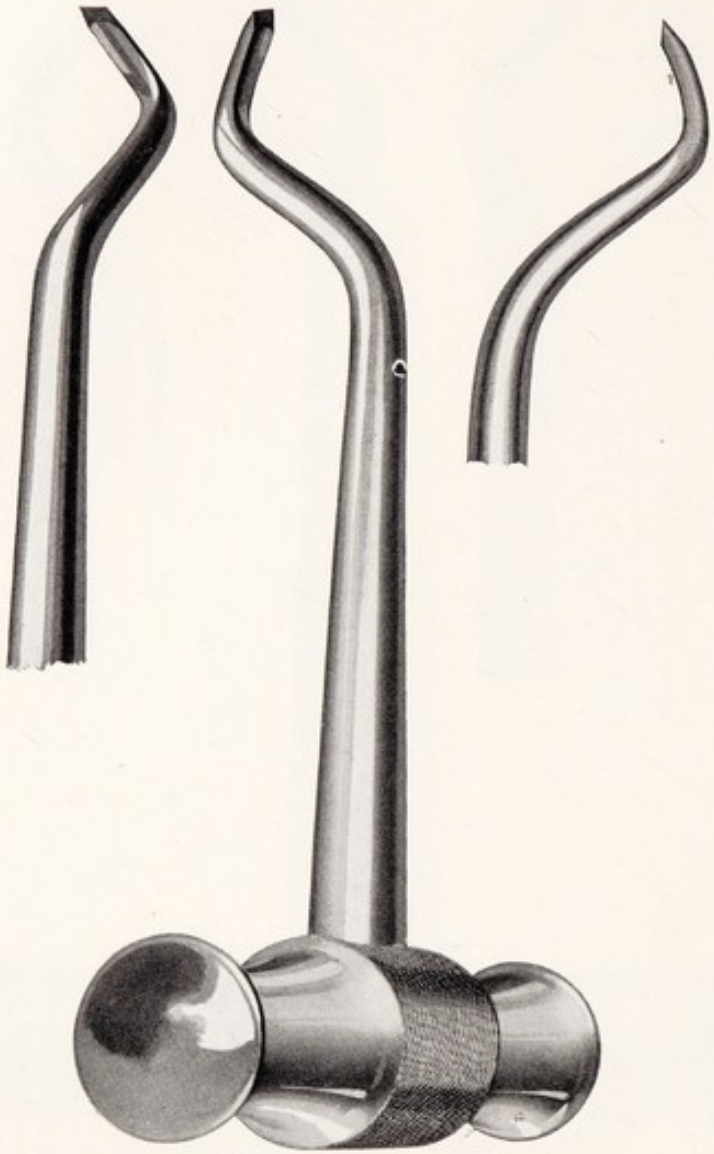


Fig. 353. — Ossisector No. 4L, 4R. Indicated for horizontal type of impaction; distal excision after ossisector No. 2L, 2R has been used.

The blade has been designed to conform to the anatomic formation of the distal surface and to permit excision of the ossistructure. The ossisector, when used for distal excision, should always be directed with the excising edge of the blade toward the ossistructure to be excised and the distal surface of the tooth, and the instrument should always be under full control of the operator. Where the ossistructure extends over the distoclusal surface, excision can be made with this instrument.

Where the ossistructure extends to the occlusal surface and this structure shows no pathologic condition, it is not readily penetrated, and another design of instrument is indicated.

Ossisector No. 2L, 2R.—Where the impaction is in a mesioangular or horizontal position the ossistructure is not frequently involved by a pathologic condition, as is usually found on the distal surface in a

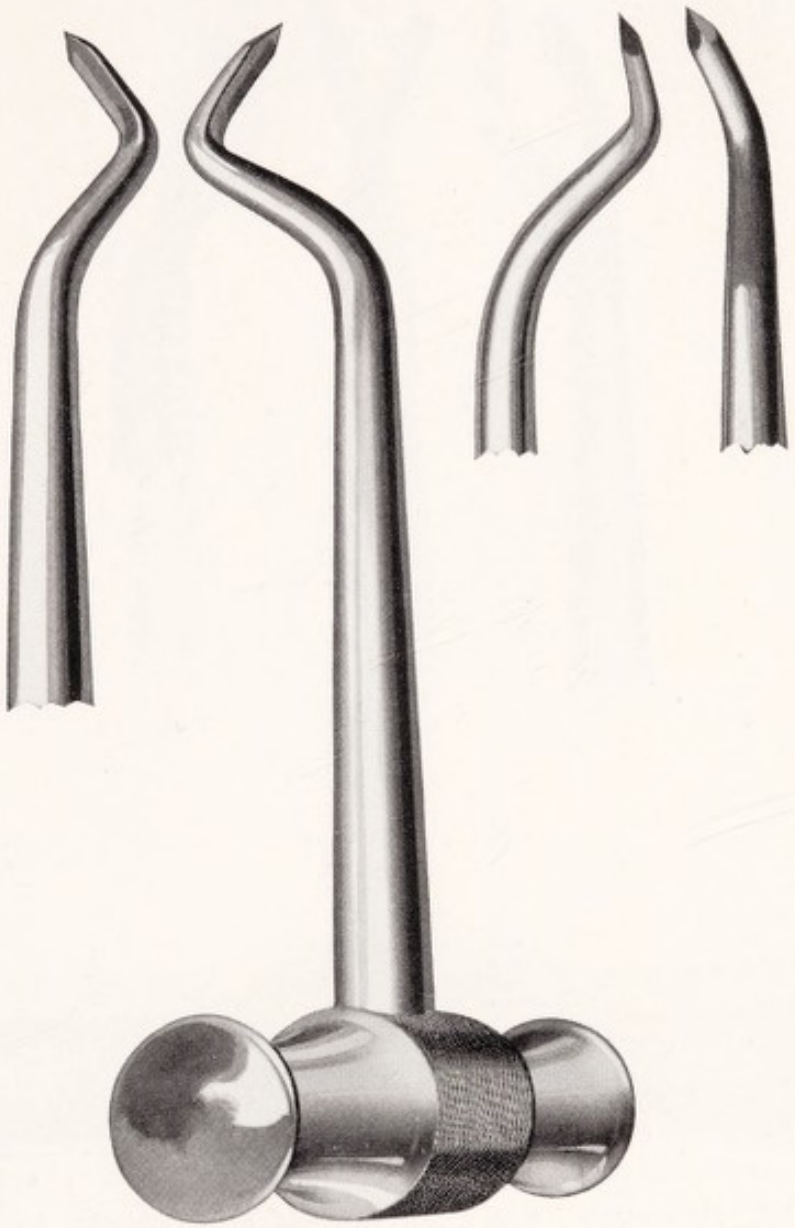


Fig. 354. — Ossisector No. 5L, 5R. Indicated for vertical, angular and horizontal types of impaction; distal excision.

vertical type of impaction. A heavier shank with more bend than would be necessary in a vertical type of impaction is indicated, and ossisector No. 2L, 2R (Fig. 351) has been designed for this purpose. The blade is slightly heavier than that indicated for the vertical type of impaction.

Ossisector No. 3L, 3R.—Where the impaction is in a distoangular

position, and there is quite a distance between the distal surface of the second molar and the corresponding surface of the third, and also where the ossistructure extends over the occlusal surface, ossisector No. 3L, 3R (Fig. 352) is indicated, and has been especially designed for this excision. The design is the same as No. 2L, 2R except that the length of the shank is increased to improve access.

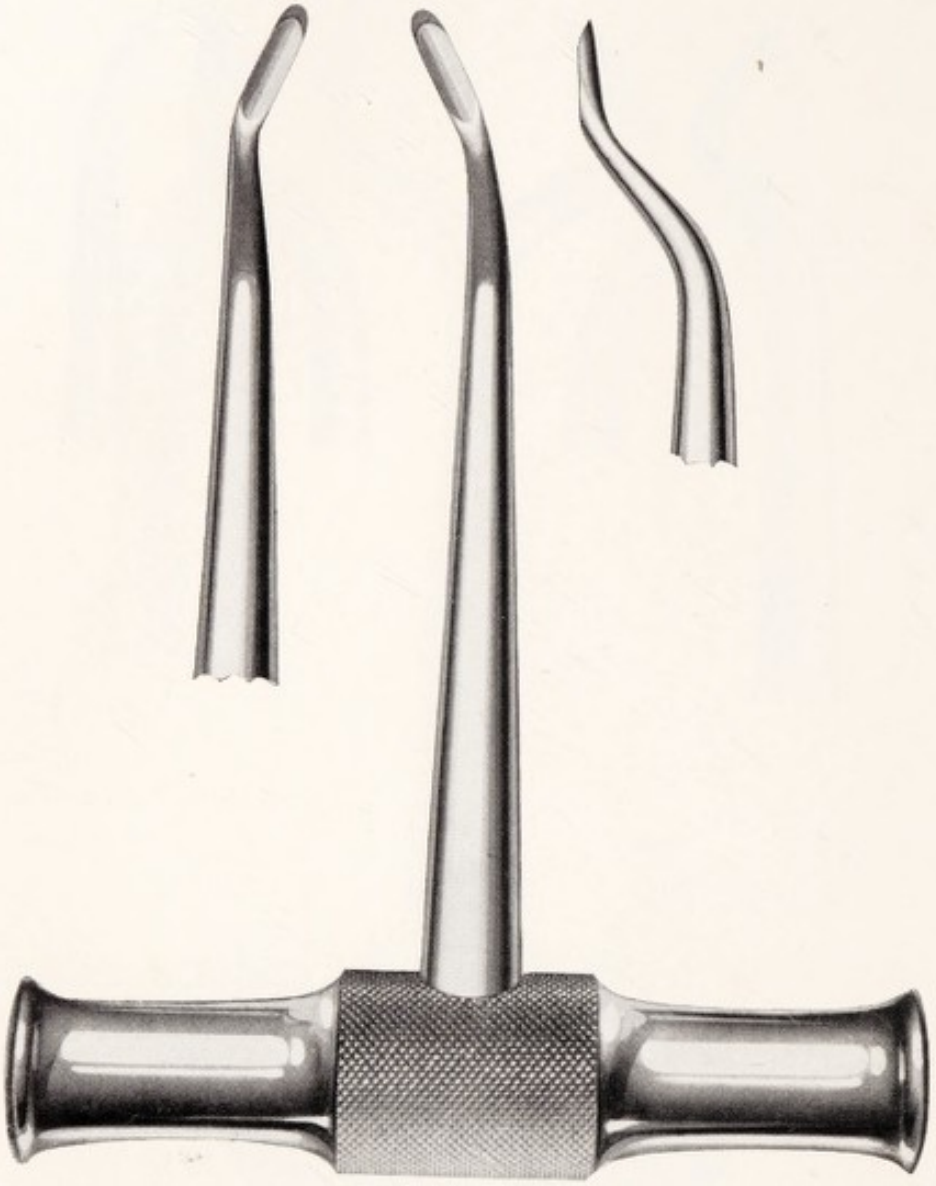


Fig. 355. — Ossisector No. 6L, 6R. Indicated as a pathfinder for vertical, angular and horizontal types of impaction.

Ossisector No. 4L, 4R.—Where the impaction is in a horizontal position, and the ossistructure extends over the greater part of the distal surface, an instrument with a heavier blade is indicated. Ossisector No. 4L, 4R (Fig. 353) is especially designed for penetrating through the dense structure. This instrument is used after ossisector No. 2L or 2R has initially penetrated and excised part of the ossistructure on the distal surface.

Ossisector No. 5L, 5R.—Where in a vertical, angular or horizontal impaction, or in a complete lingual deflection the ossistructure on the distal surface is so dense that it cannot be penetrated with ossisector No. 1L, 1R; No. 2L, 2R; No. 3L or 3R, and where, in such cases, the internal and external oblique ridges extend to the center of the distal surface of the third molar, ossisector No. 5L, 5R (Fig. 354)

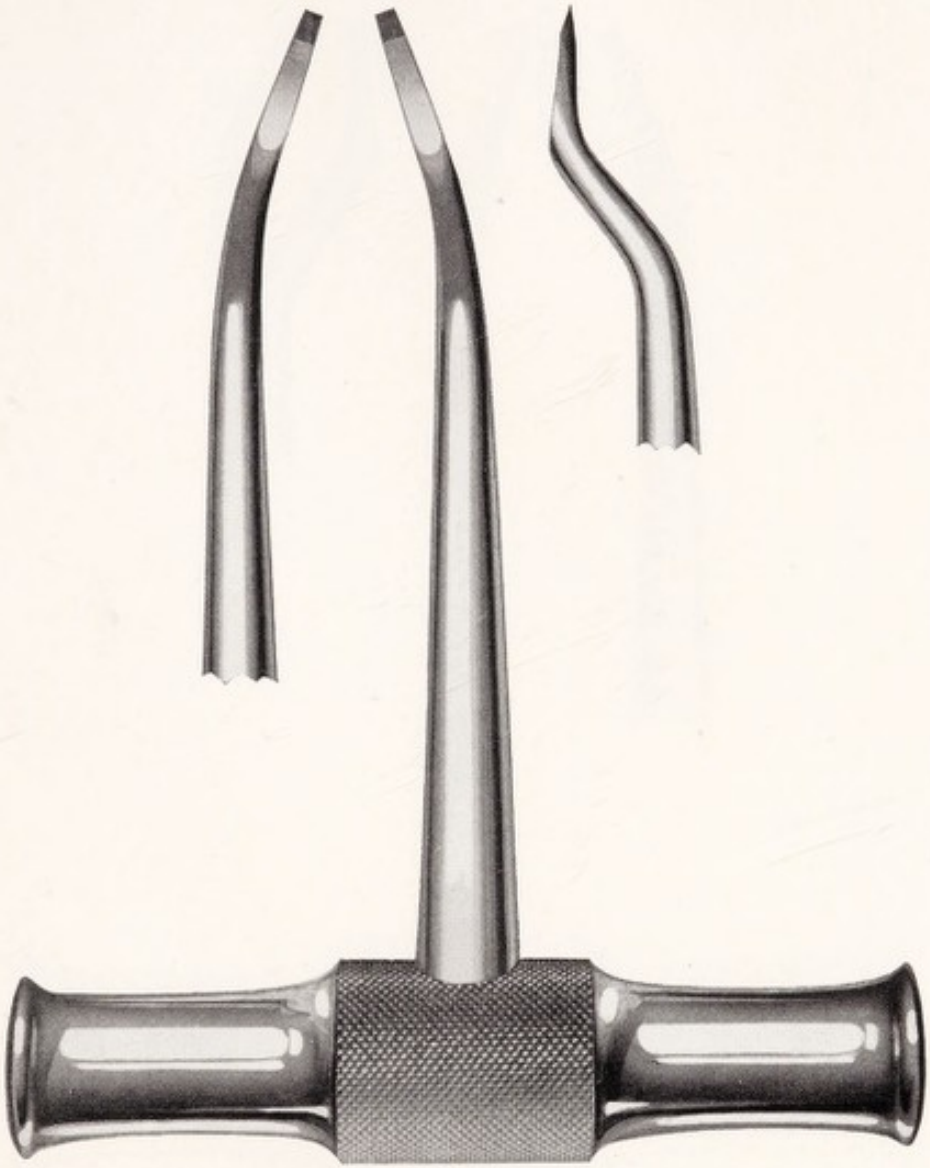


Fig. 356. — Ossisector No. 7L, 7R. Indicated in vertical and angular types of impaction; mesial excision.

has been especially designed to penetrate initially through the cortical plate and is used like a gouge. This instrument, however, should not be used for continued distal excision, but merely for penetrating through the cortical plate.

OSSISECTOR FOR MESIAL EXCISION

Ossisector No. 6L, 6R.—In the various types of impaction where the application of the exolever is indicated on the mesial and mesio-

buccal surfaces, and where the radiographic interpretation indicates that the surfaces mentioned above are inaccessible, often small spaces exist which can be located with the blade of an ossisector, thereby obviating excision. In addition, there are cases where the excision is very slight, and ossisector No. 6L, 6R (Fig. 355) has been designed for this purpose. The blade is adaptable to the mesial and mesiobuccal

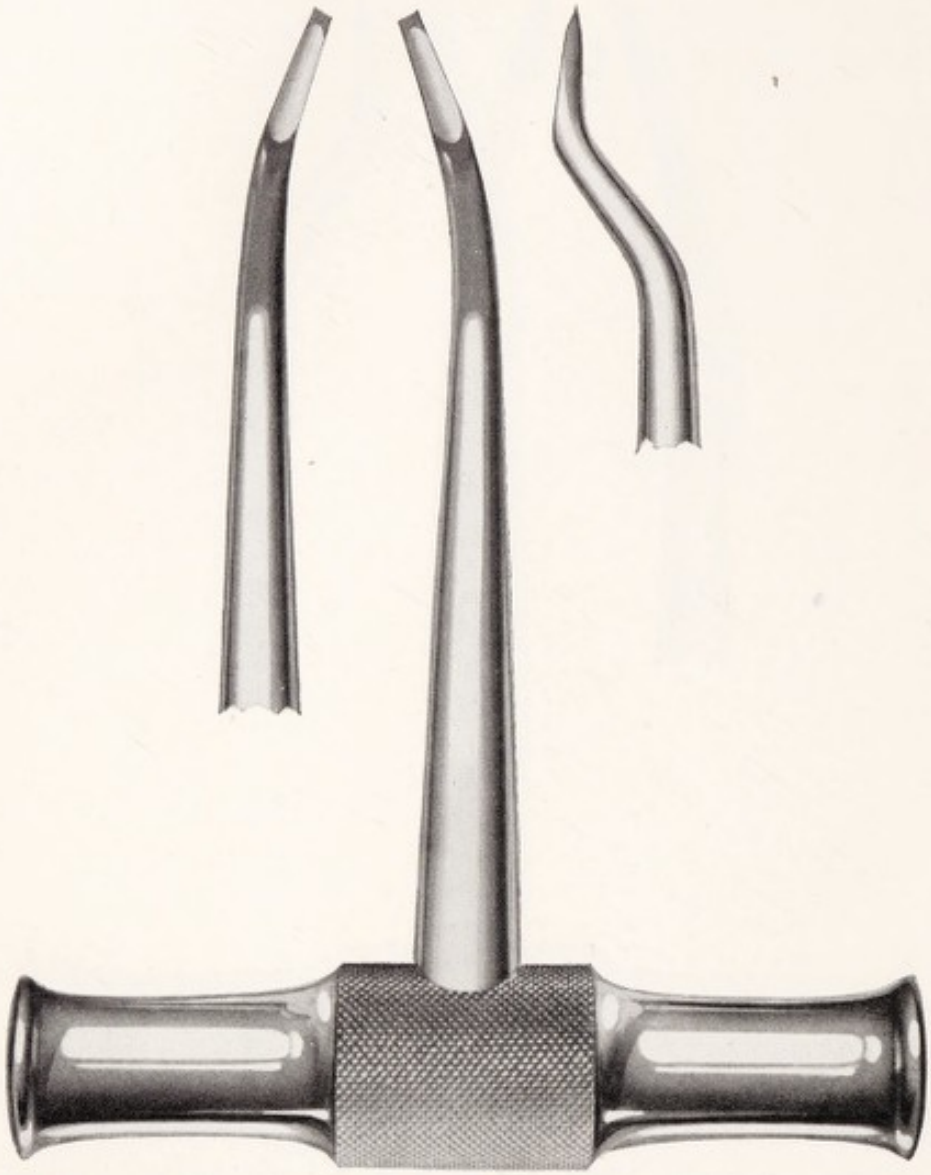


Fig. 357. — Ossisector No. 8L, 8R. Indicated for angular and horizontal types of impaction, mesiobuccal excision and for excising over occlusal surface.

surface. The instrument should not, however, be used for excising the ossistructure where it is exceedingly dense. It is primarily used as a pathfinder to determine access to the mesial and mesiobuccal surfaces.

Where the tooth is buccolingually deflected in a vertical, mesioangular or horizontal type of case, and where the superior border of the ossistructure is not a great distance from the mesial surface, this instrument is used to penetrate initially through the ossistructure, and

can often be used as an exolever where the root formation is such that not a great deal of resistance will be encountered. The length of the shank for the left side has been increased ¼ inch over that of the right side to improve access.

Ossisector No. 7L, 7R.—Where, in a vertical type of impaction, the ossistructure is to be excised along a part of the mesial surface of the

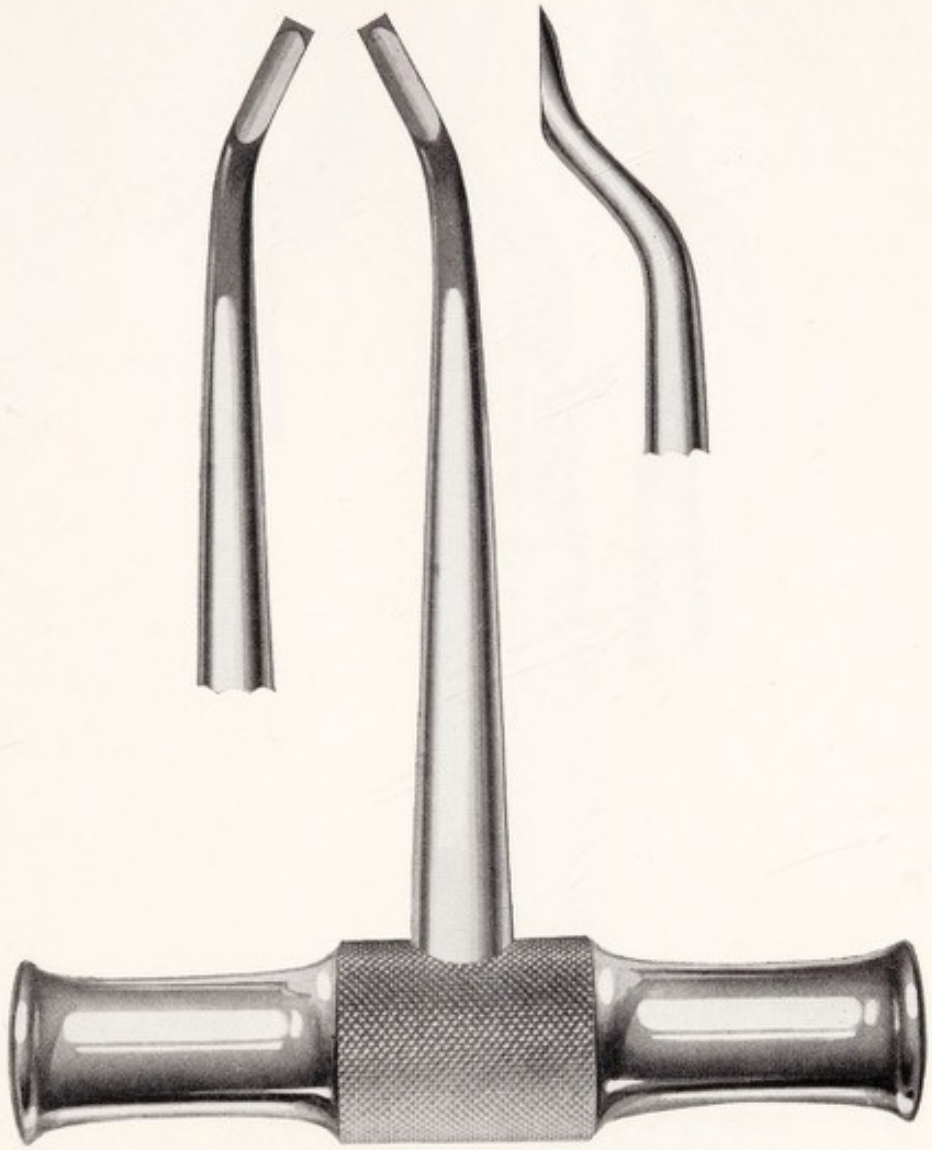


Fig. 358. — Ossisector No. 9L, 9R. Indicated for vertical and angular types of impaction, and for excision over buccal half of occlusal surface.

crown that is deflected buccally out of alignment with the distobuccal surface of the second molar; in an isolated case where excision is indicated on the mesial surface, and in all cases where the ossistructure is exceedingly heavy on the mesial surface, ossisector No. 7L, 7R (Fig. 356) is indicated, and has been designed for this purpose. This instrument is also used when excising on the mesial surface of the mesial root, where only the roots remain, and in a case where there is a deflection of part of the mesial root buccally out of alignment with

the distobuccal surface of the second molar, and excision is indicated on that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar.

Where, in a vertical impaction, the tooth is deflected lingually and the mesial surface is inaccessible, this instrument is indicated for excision to gain access to that part of the mesial surface that is

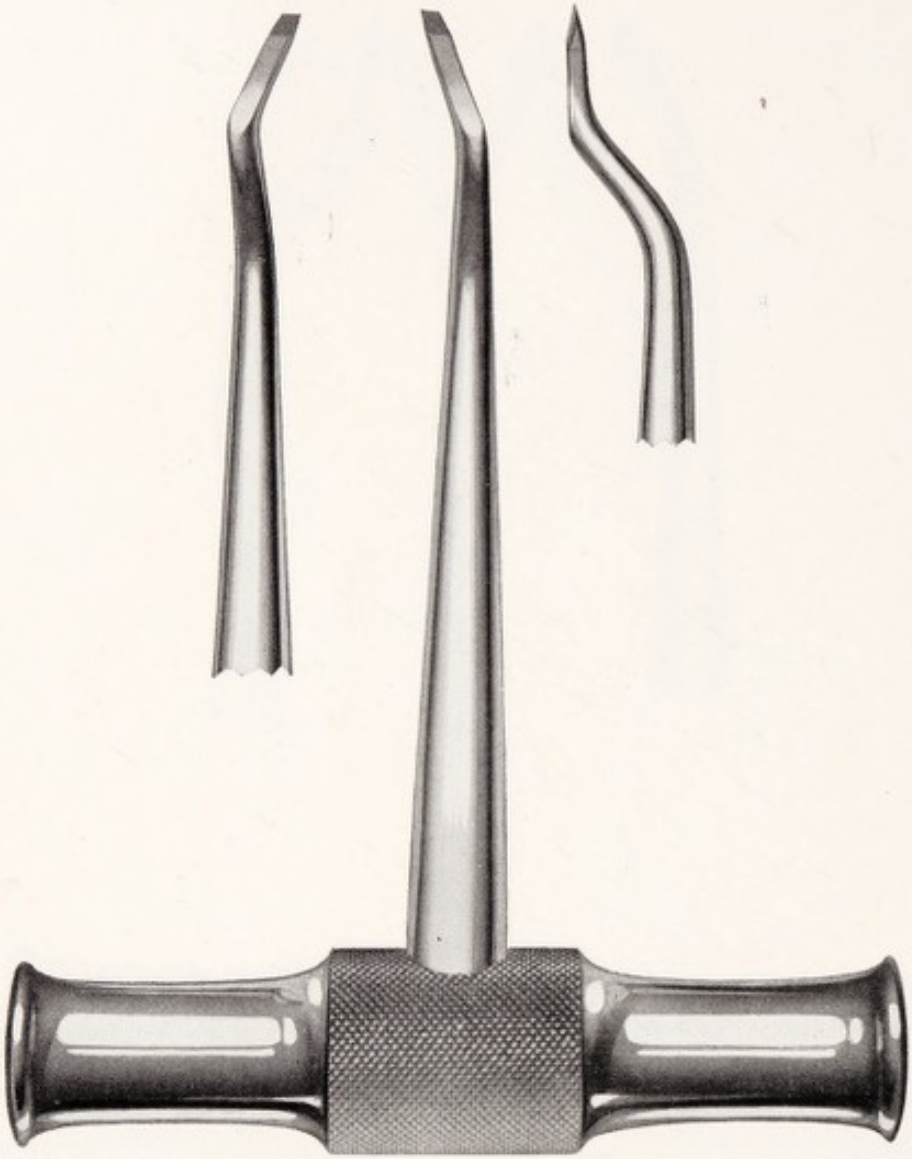


Fig. 359. — Ossisector No. 10L, 10R. Indicated for angular and horizontal types of impaction; mesiobuccal and buccal excisions.

deflected lingually out of alignment with the buccal surface of the second molar. The length of the shank for the left side has been increased ¼ inch over that of the right side to improve access.

OSSISECTOR FOR MESIOBUCCAL AND OCCLUSAL EXCISIONS

Ossisector No. 8L, 8R.—Where, in a vertical type of impaction, excision is indicated to gain access to the mesiobuccal surface; in a

mesioangular impaction, buccal deflection, where excision is indicated over the occlusal surface; in a distoangular impaction where excision is indicated on the mesiobuccal surface, and in a horizontal impaction, buccal deflection, where excision is indicated over the occlusal surface in order to reach the mesial surface, ossisector No. 8L, 8R (Fig. 357) is indicated, and has been especially designed for this

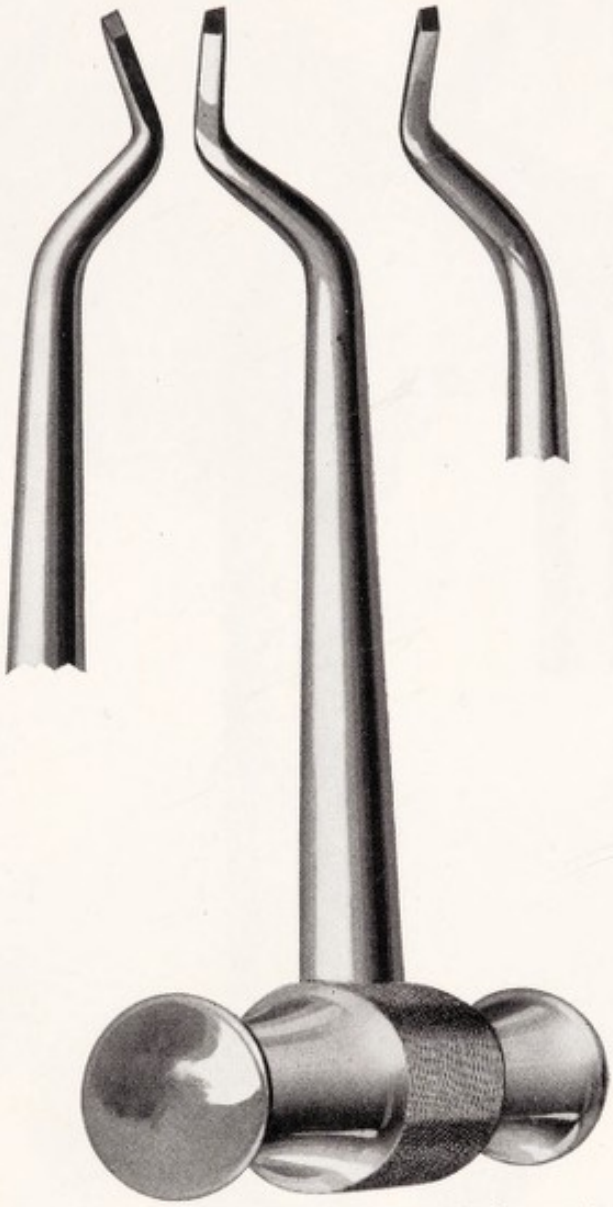


Fig. 360. — Ossisector No. 11L, 11R. Indicated for vertical, angular and horizontal types of impaction; buccal excision.

purpose. The length of the shank for the left side has been increased ¼ inch over that of the right side to improve access.

OSSISECTOR FOR OCCLUSAL EXCISION

Ossisector No. 9L, 9R.—Where, in a vertical or angular impaction, the ossistructure extends over the buccal fourth or half of the occlusal surface, ossisector No. 9L, 9R (Fig. 358) is indicated, and has been

designed for this purpose. Its use is also indicated where the third molar is impacted and the roots are partially developed, and where the ossistructure extends over the entire occlusal surface. The instrument, when used, is directed toward the occlusal surface. The length of the shank for the left side has been increased ¼ inch over that of the right side to improve access.

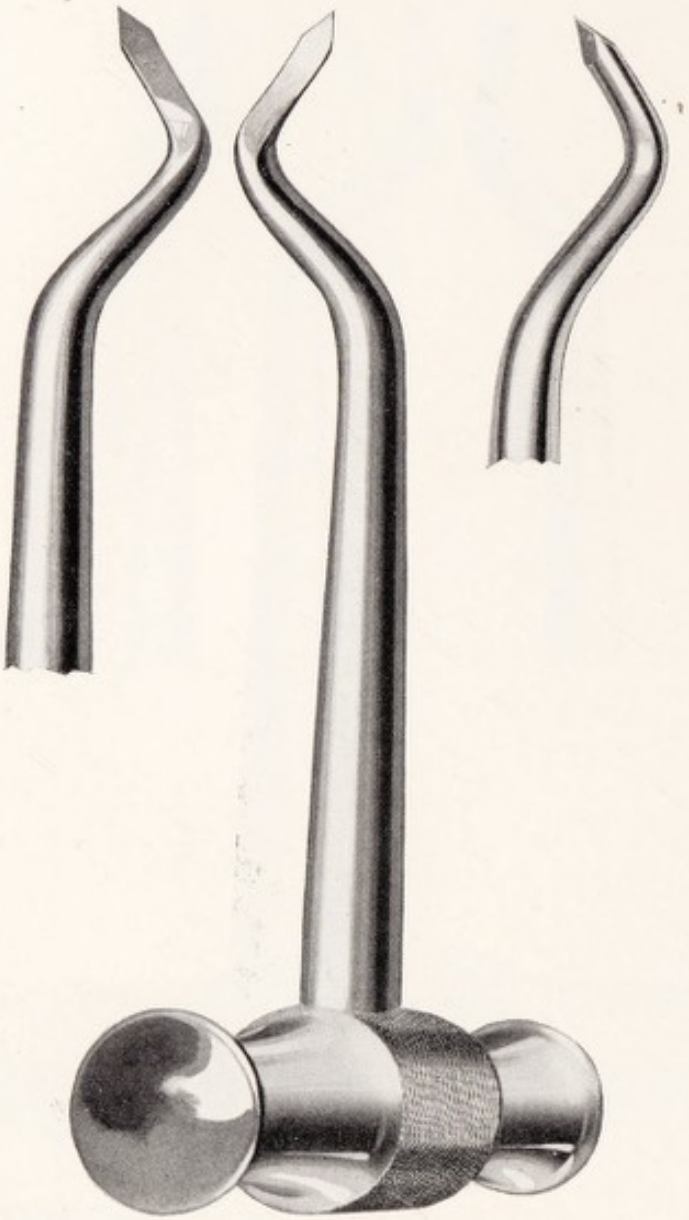


Fig. 361. — Ossisector No. 12L., 12R. Indicated for vertical and angular types of impaction; buccal excision.

OSSISECTOR FOR BUCCAL EXCISION

Ossisector No. 10L, 10R.—In all types of impaction where excision is indicated on the buccal surface in order to gain access to the mesial surface, especially where there is a close contact of the crown with the distobuccal surface of the second molar, ossisector No. 10L, 10R (Fig. 359) has been designed for this purpose. The blade is small,

but possesses sufficient strength to excise the ossistructure, especially where it has not been involved by a pathologic condition. The length of the shank for the left side has been increased ¼ inch over that of the right side to improve access.

Ossisector No. 11L, 11R.—Where, in a vertical, angular or horizontal impaction, excision is indicated on the buccal surface at or

Fig. 362. — Holding Ossisector—Left Side. Manner of holding properly an ossisector (in this case ossisector No. 2L, shown in Fig. 351) for making a distal excision on left side of arch.

distal to the bifurcation of the tooth, ossisector No. 11L, 11R (Fig. 360) is indicated, and has been designed for that purpose. The instrument, which has a small blade, is directed as closely as possible to the buccal surface of the tooth and can also be used to penetrate through the space between the buccal surface and the ossistructure on this surface which is so often present. This instrument is also

indicated for excising the ossistructure over the lingual fourth or half of the occlusal surface.

Ossisector No. 12L, 12R.—Where, in a vertical or an angular type of impaction, the external oblique ridge extends over the entire buccal surface of the tooth, ossisector No. 10L, 10R or No. 11L, 11R is not suitable to penetrate initially through the dense cortical plate, ossi-

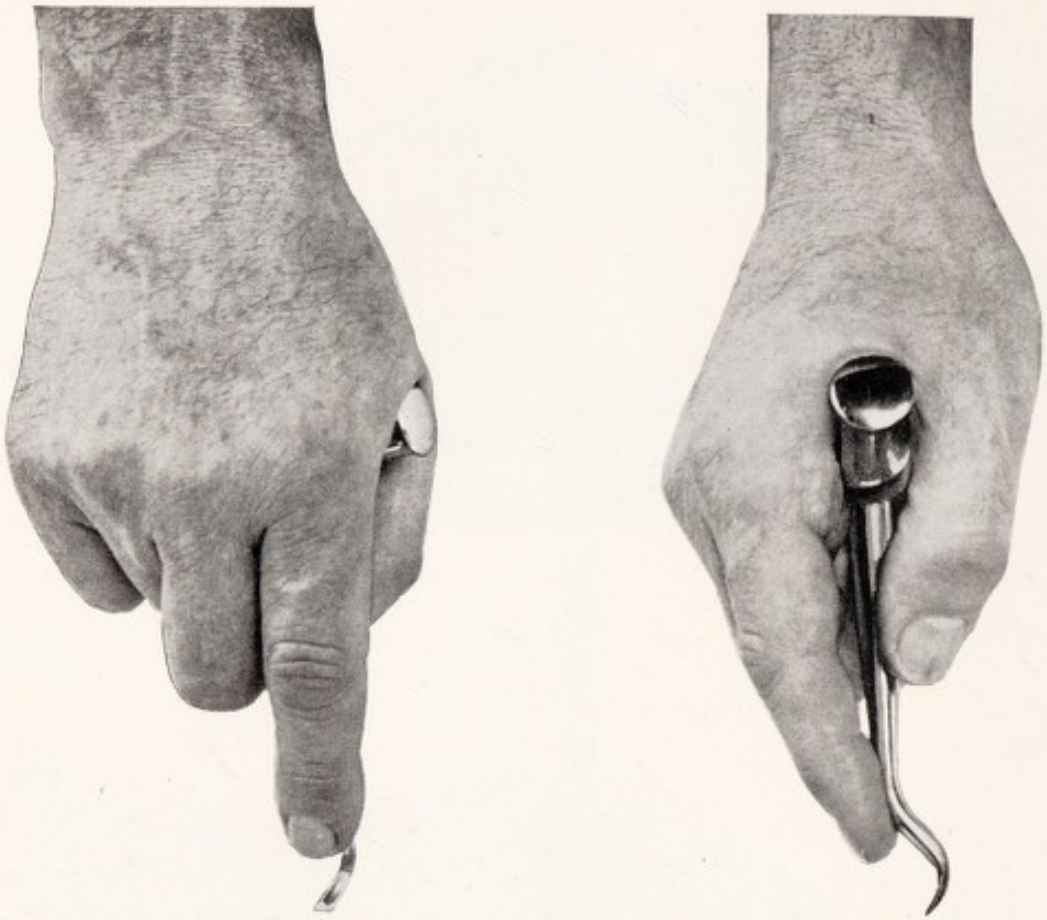


Fig. 363. — Holding Ossisector—Right Side. Manner of holding properly an ossisector (in this case ossisector No. 2R, shown in Fig. 351) for making a distal excision on right side of arch.

sector No. 12L, 12R (Fig. 361) has been designed for that purpose, and is used like a gouge or as a starter to penetrate the cortical plate in order to permit ossisector No. 10L, 10R or No. 11L, 11R to excise further the ossistructure.

Holding the Ossisector.—The handle and shank of the ossisector is formed so that it may be securely held in the hand, as shown in Fig. 362, where the instrument for the left side is shown, and in Fig. 363, where the instrument for the right side is shown.

CHAPTER XV

Operative Technic

IN the chapter on "Clinical Examination" (page 3) and the various chapters on "Interpretation of the Radiogram" every diagnostic point pertaining to the impacted mandibular third molar has been described and carefully analyzed, and the diagnostic points presented will form the basic principle on which the operative technic is to be conducted.

In order to prescribe a definite operative technic, certain fundamentals must be observed to form the groundwork of the procedure, and these fundamentals are the anatomy of the parts involved and the rules governing the manipulation with the exolever for the extraction of the impacted tooth. The radiogram of a case will give a definition of the position of the impacted tooth, the character of the root formation and the supporting ossistructure, including the condition of the second molar, and from this definition the operator will determine the technic he is to follow in order to extract the tooth with minimum injury to its supporting structure.

The operator should seriously consider not only the extreme type of impaction, nor the occasional case of an unusual character that is probably seen once in a lifetime, but he should also carefully study every case that may be presented, as the technic for an extreme or an occasional case would be a modification of the procedure followed in the cases that occur in usual practice.

It has been the observation of the author that a case of impaction that may appear as a simple operation to an operator who is not guided by a definite operative procedure may prove to be of a complicated character when the operation is undertaken.

Methods that are free of guesswork, that avoid extensive explorative work and that reduce trauma to a minimum are ideals to be attained in exodontia technic. Every diagnostic point in the clinical findings and radiographic interpretation is of vital importance in the prognosis of the case, and as much *finesse* can be associated with the extraction of an impacted mandibular third molar as with any other operation performed in the oral cavity.

The region of the third molar is not readily accessible, the tooth being the last one in the posterior part of the arch, and careful thought should be given to any operative procedure to be executed in this part of the mouth. When the operator is about to take the first step in the operative technic, he should have a mental picture,

as it were, of every movement he contemplates executing, and he should definitely outline his plan of operation in accordance with the radiographic and clinical findings previously established.

Summarizing all the details of an operation in advance will enable the operator to execute the instrumentation with a precision that will avoid the injury usually associated with the extraction of an impacted third molar. The adoption of a definite technic based on scientific principles, with careful attention given to every detail, will make an accomplished operator.

Special attention should be given to the details pertaining to making the clinical examination and radiographic interpretation of a case, as this part of the procedure has an important bearing on the successful extraction of an impacted third molar. The lack of proper attention to any one detail may increase the length of the operating time and aggravate the trauma.

When the operator is executing the operative technic, every step of the procedure should be followed as described for each type of case. If results are to be obtained that are free of guesswork and that have not caused any trauma, careful attention to all details pertaining to the operative procedure should be observed. Should the operator overlook any detail when excising the ossistructure or when applying the exolever, the result will not be of the character expected.

The dependability of the technical procedure, the experience of the operator, the environment under which the operative procedure is conducted and the anesthetic employed have a bearing on the shock and traumatism that may result from the operation. The object to be attained is to reduce to a minimum the occurrence of any untoward incident by confining the excision of the ossistructure to the area indicated by the radiogram of the case, and to understand fully the "principles of the lever" during extraction with the exolever.

SHOCK

Shock, in medical or surgical terminology, is that condition of the system where there is a sudden exhaustion of the vital forces of the muscular and vasomotor mechanisms, produced by a stimulus exerted on those organs and the nervous system, indicating that exhaustion is the factor and shock is the result.

There are two kinds of shock phenomenon, classed respectively as traumatic and psychic. The traumatic shock is of a physical nature, while the psychic shock is of an emotional nature. The traumatic shock is one following the infliction of a wound, and may be with or without laceration. There is laceration in the case of a broken con-

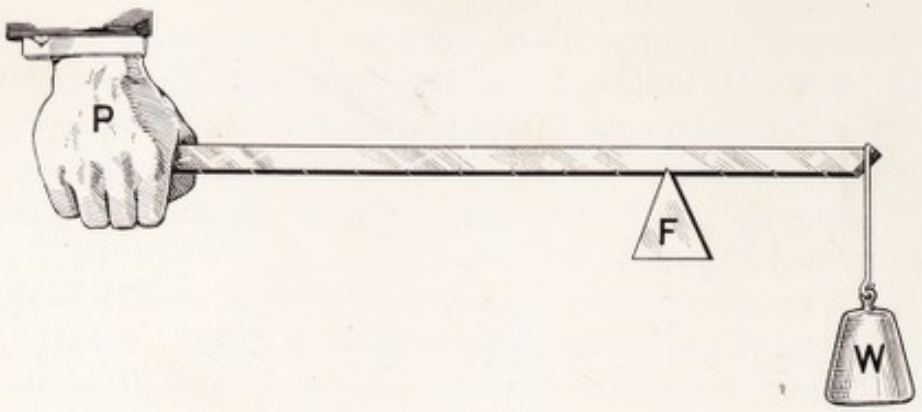
tinuity of the skin or membrane, and no laceration in the case of a contusion or similar injury. In the extraction of a tooth there is necessarily what is termed an open wound, as there is always some laceration of vital tissue. The shock resulting from the fracture of a tooth during the extraction has the same causation as the shock from a lacerated injury.

Man has a certain amount of potential energy stored in the brain, suprarenals and liver. The extraction of a tooth, usually causing injury to the peripheral nerve trunks, exerts a stimulus on the organs mentioned, particularly on the brain, producing a drain on the stored energy (i.e., exhaustion), followed by a suspension of certain bodily function, effecting a weakening of the entire system. This is usually accompanied by a lowering of the blood pressure, as in shock the blood becomes massed in the larger venous trunks. The excessive discharge of potential energy produces exhaustion, which is the etiologic factor in shock, causing during the shock morphologic changes in the brain cells. This brain cell exhaustion is the inevitable result of pain caused by the extraction of a tooth, and the exhaustion is lessened to the extent that the sense of pain is reduced by the administration of an anesthetic.

Psychic shock is caused, as a rule, by fear or apprehension, and is produced by the auditory, visual or olfactory senses, superinduced frequently by autosuggestion; as, for example, by the clanging of instruments, the sight of preparation for an operation or the odor of antiseptics or other medicinal agents. In psychic shock the brain is affected in the same manner and undergoes the same morphologic changes as when caused by shock from traumatic injury, with the modification that psychic shock is usually not so intense as the traumatic shock, and the morphologic brain changes are correspondingly less, depending on the physical resistance of the patient to emotional manifestations.

TRAUMA AND TRAUMATISM

The words *trauma* and *traumatism* have been used indiscriminately by some writers to indicate a wound or injury to some part of the human body. A distinction should, however, be made in applying these words, as *trauma* should refer specifically to the wound or injury, and *traumatism* should refer to the more or less abnormal condition of the system resulting from the pain or shock inflicted by the trauma —that is, the wound or injury. In the case of extraction of a tooth the trauma would be the injury to the tissues surrounding the tooth or to the adjacent ossistructure; or the fracture of a tooth may be classed as a trauma, and the resulting physical effect, if any occurred,



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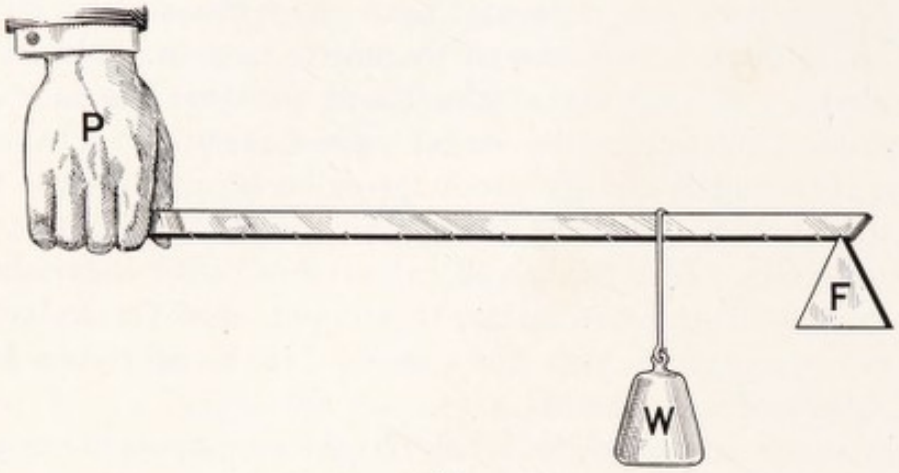

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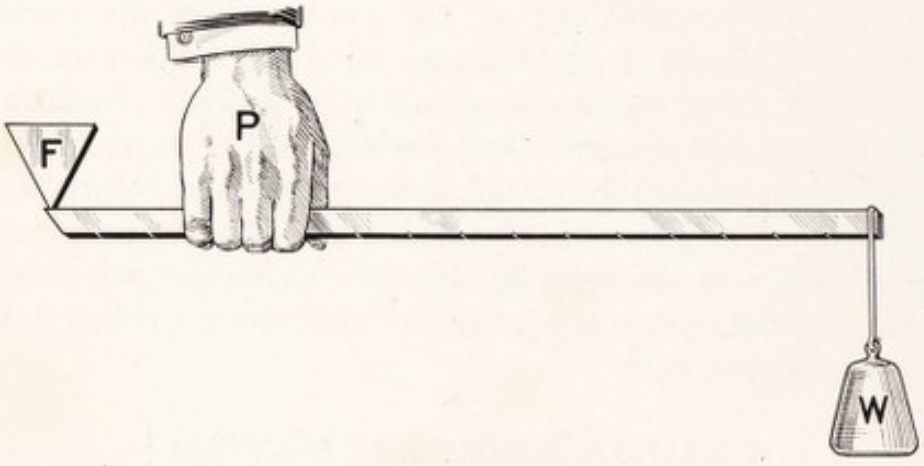

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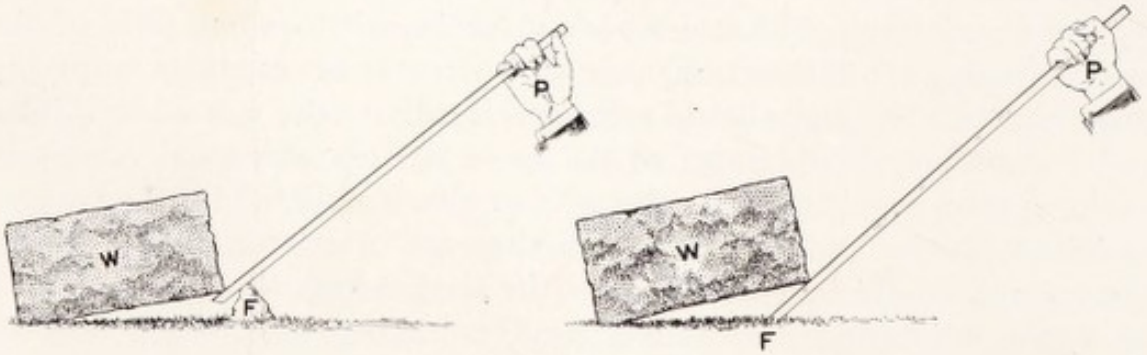


4 Fig. 364 5

on the nervous system or vasomotor mechanism—such as exhaustion, accompanied by low blood pressure—would be characterized as traumatism.

Traumatism is the result of a discharge of potential energy residing in the brain, suprarenals and liver, the brain being particularly affected. The discharge is caused by the stimulus exerted by the pain and shock of the extraction, producing a condition of exhaustion of the system, accompanied by low blood pressure and temporary suspension of the activity of the muscular and vasomotor mechanisms.

The treatment of traumatism after the extraction, if no pathologic or other untoward symptoms are manifested, is to assure the patient that the procedure has been successful, and that a short stay in the rest room will bring about a normal feeling. The exhaustion will be gradually followed by a return to normal.

THE PRINCIPLE OF THE LEVER

Lever, One of Six Powers.—The lever is one of the six simple mechanical devices by the use of which a person is able to exert a power or perform work that he could not accomplish with only the direct use of his hands. These six mechanical devises are: (1) the lever; (2) the wheel and axle; (3) the pulley; (4) the inclined plane; (5) the wedge, and (6) the screw, all of which possess the factor of multiplying in various degrees the initial power that may be applied.

Simple Lever.—The simple lever is a rigid bar of iron or steel of a convenient length, with the bar moving on a fixed point termed a fulcrum, and the parts of the bar on either side of the fulcrum termed the arms, the long arm forming the handle with which to exert the power. There are three classes of simple levers, the class depending on the position of the power, weight and fulcrum, and these constitute the three essential parts of a lever.

Three Classes of Levers.—In Fig. 364 are shown illustrations of the three classes of levers (1, 2, 3). In a lever of the first class (1) the fulcrum is below the bar, with the weight at the distal end of the bar. In a lever of the second class (2) the fulcrum is below the bar, with the

Fig. 364.—Three Classes of Levers and Illustration of Principle of Simple Lever. *1*, *2* and *3* represent three principles of action of lever, as explained above.

1 represents a lever of first class. Fulcrum (F) is below bar, with weight (W) at distal end, and power (P) is pressing downwardly on bar.

2 represents a lever of second class. Fulcrum (F) is below bar, with weight (W) a short distance from distal end, and power (P) is lifting upwardly on bar.

3 represents a lever of third class. Fulcrum (F) is above bar, with weight (W) at distal end, and power (P) is lifting upwardly on bar.

4 represents an application of lever of first class (*1*), where power is pulling downwardly on lever, exerting a force to lift weight upward, and a small projection on base is used as a fulcrum.

5 represents an application of lever of second class (*2*), where power is *pushing upwardly* on lever, exerting a force to push (instead of lifting) weight upward, and base is used as a fulcrum.

weight a short distance from the distal end of the bar. In a lever of the third class (3) the fulcrum is above the bar, with the weight at the distal end of the bar. The Letters, P, W and F represent, respectively, power, weight and fulcrum.

In the application of the principle of the lever to the extraction of the impacted third molar, the action of the lever of the first class (1) is the factor usually employed, and sometimes the action of the lever of the second class (2) is used. The diagram of the lever of the third class (3) is shown only for the purpose of presenting the three lever principles.

In No. 4 of Fig. 364 is represented an application of the lever of the first class (1), where the power is *pulling downwardly* on the lever, exerting a force to lift the weight upward, and the small projection on the base is used as a fulcrum. Number 5 represents an application of the lever of the second class (2), where the power is *pushing upwardly* on the lever, exerting a force to push (instead of lifting) the weight upward and the base is used as a fulcrum.

Illustration of Principle of Simple Lever.—For the purpose of illustrating the principle of the lever action, the following examples are given: In a lever of the first class (1), 16 inches long, with the fulcrum (F) 4 inches from the weight, a downward power of 1 pound at the end of the long arm (P) will balance a weight or exert a force of 3 pounds at the end of the short arm (W). With the fulcrum 3 inches from the weight, a power of 1 pound will exert a force of 4⅜ pounds; with the fulcrum 2 inches from the weight, a power of 1 pound will exert a force of 7 pounds; with the fulcrum 1 inch from the weight, a power of 1 pound will exert a force of 15 pounds, and with the fulcrum ½ inch from the weight, a power of 1 pound will exert a force of 28 pounds.

In a lever of the second class (2), 16 inches long, with the weight 4 inches from the fulcrum, an upward power of 1 pound will balance a weight or exert a force of 4 pounds.

In a lever of the third class (3), 16 inches long, with the power 4 inches from the fulcrum, an upward power of 1 pound will balance a weight or exert a force of ¼ pound.

Application of Principle of Simple Lever to Exolever.—It will be observed that in a lever of the first class (1) the closer the fulcrum is to the weight, the greater will be the force exerted with the power. Applying this principle to the technic of extraction, it will be understood that the closer the fulcrum is to the tooth to be extracted, the greater will be the force exerted with the handle of the exolever.

It is the factor of multiplied power which constitutes the principle of the lever of the first class (1) that is demonstrated in the use of the exolever in extracting an impacted mandibular third molar. In the

technic of extraction the "weight" is the tooth to be extracted, the "power" is the handle of the exolever and the "fulcrum" is either the distal surface of the second molar, or the ossistructure on the mesial, distal, buccal or mesiobuccal surface of the tooth. The power may be exerted with the handle downward, in a horizontal position or at an angle, there being applied in the different movements the fundamental principle of the lever of the first class (1).

Power of Exolever Compared with Power of Simple Lever.—The length of the exolever, including the handle, shank and blade, is about 4½ inches, or approximately three-tenths the length of the 16-inch bar used as an example for illustrating the principle of the simple lever, where a power of 1 pound on the long arm, with the fulcrum ½ inch from the weight, will exert a force of 28 pounds on the weight.

As the exolever is about three-tenths the length of the bar, 1 pound of power on the handle, with the fulcrum ½ inch from the tooth, should exert, theoretically, a force of three-tenths of 28 pounds, or about 8 pounds, on the tooth. The force necessary to be applied with the blade of the exolever to an impacted mandibular third molar for its extraction will vary from 1 to 8 pounds, depending on prevailing conditions, which would indicate that a power of from ⅛ to 1 pound on the handle of the exolever should be, theoretically, sufficient to extract the tooth. As, however, the full power of the hand of the operator cannot be applied at the extreme end of the handle of the exolever, as the hand will extend to a considerable extent over the handle along the shank toward the fulcrum, thereby reducing the lever value of the length of the shank and decreasing the leverage, a power of from 1 to 16 pounds will be required on the handle to extract the tooth, the power of 16 pounds being sufficient to extract a mandibular third molar in an extreme case of impaction.

Difficulty with Forceps Technic.—As an operator, when attempting to use the forceps technic in the extraction of an impacted mandibular third molar, will have difficulty in exerting a power of 8 pounds in a direct upward pull, without a lever action, it can be readily understood that it will be practically impossible to extract such a tooth with forceps, even if the forceps could be properly applied, which application can be seldom made without extensive unnecessary excision of the ossistructure.

FULCRUM

A suitable fulcrum should be obtained upon which to rest the exolever when it is being applied for the extraction of the tooth. In the interpretation of the radiogram preceding the operation the operator should determine the available fulcrum, which, in the majority of cases, is the ossistructure, and, where the ossistructure is not avail-

able, the second molar may be used for that purpose. The use of the second molar as a fulcrum should, however, be avoided wherever possible, but cases will be presented where it will be impossible to use any part of the ossistructure as a fulcrum, and in such cases the second molar must be utilized for that purpose.

OSSISTRUCTURE USED AS A FULCRUM

There will be cases where excision of the ossistructure should be made in order to obtain a fulcrum, and there will be other cases where no excision is indicated. There is often a pathologic involvement of the ossistructure at a point that is to serve as a fulcrum, but such ossistructure will not make as secure a fulcrum as that which is not involved.

The mesial, mesiobuccal and buccal surfaces of the third molar are usually engaged by the exolever, and the ossistructure on these surfaces is used as a fulcrum for this instrument. When estimating the value of the ossistructure as a fulcrum, consideration should be given to the position of the crown, the character of the root formation, the age of the patient and the relation of the crown of the third molar to the second molar.

Excision is often made to gain access to the mesial, mesiobuccal or buccal surface of the third molar, and consideration should be given at the same time to the ossistructure that is to serve as a fulcrum. Care should be taken in excising the ossistructure, as too extensive excision may destroy the fulcrum, and in such a case it will be placed too far away from the surface to be engaged by the instrument, which will cause the power of the exolever to be lost and further complicate the case. A good fulcrum at the mesial, mesiobuccal or buccal surface is also often destroyed by experimental applications of the exolever, and these should be avoided. As the location of the fulcrum varies according to the deflection of the third molar, consideration in advance of the operative procedure of the ossistructure to be used as a fulcrum will minimize the possibility of destroying unnecessarily a good fulcrum.

The external oblique ridge is often closely related to the mesial, mesiobuccal and buccal surfaces of the third molar, and this structure will often serve as a fulcrum to support the exolever, in which case an examination of the external oblique ridge, in its relation to the surfaces to be engaged, should be made when such procedure is indicated.

Where pathologic changes have involved the ossistructure and destroyed what would have been a good fulcrum, especially on the buccal surface at or distal to the bifurcation, excision is often made to

a point where a more suitable fulcrum can be obtained. The ossistructure available as a fulcrum will depend on the type of impaction and any deflection that may be present.

In a vertical impaction where there is no deflection the interseptum and the ossistructure anterior to the mesial or mesiobuccal surface is used as a fulcrum. Where part of the mesial surface of the crown of the third molar is deflected buccally out of alignment with the distobuccal surface of the second, the structure along the deflected part of the crown that is out of alignment buccally is used in the majority of cases as a fulcrum. In a mesioangular impaction the ossistructure along the mesial surface and anterior to the occlusal surface where the tooth is deflected buccally is utilized as a fulcrum, as is also the ossistructure on the buccal surface for the final exolever movement. In a distoangular impaction the available parts to be utilized as a fulcrum are the same as described in a vertical impaction. In a horizontal impaction the ossistructure at the mesial surface, the external oblique ridge and the ossistructure below and anterior to that part of the mesial surface of the third molar that is out of alignment buccally with the distobuccal surface of the second molar can be utilized as fulcrums.

SECOND MOLAR USED AS A FULCRUM

In cases where the ossistructure is not available as a fulcrum the second molar is utilized for that purpose, which condition occurs more frequently in a vertical than in any other type of impaction.

In Chapters VIII, IX and X descriptions are given of all diagnostic points to be determined in the radiogram relative to the second molar, and attention is directed to that type of mandibular second molar where the roots are fused, which is not a suitable tooth to be used as a fulcrum. Where there is an involvement of the interseptum between the first and second molars, and the latter tooth is not firmly attached to the supporting ossistructure, the second molar will not be a suitable fulcrum. If during the operative procedure it is observed that an injury may occur to the second molar, the procedure should be discontinued, and the ossistructure should be used, if possible, as a fulcrum to complete the extraction. Where the second molar is not supported by the first molar, the second molar will not make as practical a fulcrum as where the tooth is stabilized by the first molar, and, if in such a case the operator is not thoroughly experienced in the necessary procedure, the second molar should be reinforced.

The second molar, after its condition has been interpreted in the radiogram, is carefully examined where its use as a fulcrum is being considered, so that no injury may occur to the tooth during the extrac-

tion movements of the third molar. The position of the crown of the third molar and its root formation will indicate, in some cases, the use of the second molar as a fulcrum, and especially will this procedure be indicated where the ossistructure anterior to the crown is not, on account of some untoward condition, available as a fulcrum. While it is advisable to utilize, wherever practicable, some structure other than the second molar for this purpose, so that the tooth may not be subject to possible injury during the extraction of the third molar, the second molar may be utilized as a fulcrum without injury to the tooth if proper judgment is used and the necessary precaution is taken.

In making an examination of the condition of the second molar where it has a gold crown or a filling, or where it is serving as an anchorage for a bridge, the strength of the crown should be estimated with a view to avoiding the exertion of any unnecessary pressure on the second molar.

An examination of the second molar should especially include an interpretation of the root formation. Where the roots are of a conical shape and fused into a solid mass, with no septum, an unusual degree of pressure will loosen the tooth. If, however, the roots are long and markedly separated, with a heavy septum, usually no injury will follow the use of the second molar as a fulcrum. When the second molar is to be utilized for this purpose, the exolever to be used should have a blade that will glide smoothly over the distal surface, so that it will not be marred by the instrument. Excessive pressure should not be applied to the second molar, but, should any unusual resistance be presented during the extraction, the ossistructure causing the resistance should be more freely excised, thereby minimizing the liability of injury to the second molar.

In most cases in the extraction of the third molar the second molar is used merely as a preliminary fulcrum to start the third molar distally. If, however, it is considered advantageous to utilize the second molar as a fulcrum in the application of the exolever for the extraction of the third molar, the operator should observe whether the first molar is in position, as the second molar cannot be safely employed for this purpose unless it is supported by the first molar. In case the first molar is absent, resort must be had to some artificial reinforcement of the second molar.

REINFORCING THE CROWN OF THE SECOND MOLAR

If, when executing the exolever technic on the third molar, the root of the second molar is of a conical shape, or there is a slight pathologic condition on the distal surface of the second molar, the operator should apply one of the fingers of the left hand to its occlusal

surface in order to reinforce it, and by this application maintain a sense of touch that will indicate any disturbance to the second molar that may occur. If during the operative procedure such disturbance is indicated, the operator should at once alter his technic so as to avoid endangering the second molar.

Reinforcing the second molar is also accomplished by inserting a wooden block, properly carved to fit the space, between the second molar and the anterior tooth; or heated modeling compound may be pressed into the space and subsequently chilled where the wooden block cannot be advantageously used.

EXCISION OF THE OSSISTRUCTURE

Excision of the ossistructure supporting an impacted mandibular third molar is indicated when the structure interferes with the application of the exolever or the execution of the exolever movements. The excision should be confined to the area that will be most advantageous for the exolever technic that is to be employed, as promiscuous excision with no other object than to extract the tooth will prolong the operation unnecessarily and will increase trauma. If the excision is confined to a definite area in accordance with the interpretation of the radiogram and the indicated application of the exolever, a better postoperative result will be obtained. The excision should be in conformity with the application of the exolever that is to be made to the mesial, mesiobuccal, distal or buccal surface for the execution of the exolever movements and with the object of decreasing resistance when extracting the tooth. In addition to the application of the exolever, a suitable fulcrum must be obtained, and excision, when indicated for securing a suitable fulcrum, is made at such a point as may be most expedient. Any involvement of the ossistructure by pathologic changes will decrease the excision in a great many cases, often making it possible to apply the exolever without excision; in fact, such an involvement is often an advantage to the technic, but in an occasional case it is a disadvantage.

STERILIZATION

Sterilizing Operating Field.—The area surrounding an impacted mandibular third molar should receive, before operating, the same degree of aseptic preparation that is followed in the case of any other surgical procedure on the human body. Not only should the immediate field be properly treated, but the surrounding interproximal spaces should be thoroughly sprayed with an antiseptic solution, so that any débris that may have accumulated around the adjoining teeth is removed, and as nearly as possible a hygienic condition of the mouth obtained.

During the operation care should be taken not to allow any fluids of the mouth to enter the field, and all blood should be absorbed as rapidly as it appears. The operator should endeavor to have a blood clot established as early as the condition will permit. Any débris or infectious matter that may be under the gum tissue folds should be syringed away, and the probe will be found to be a convenient instrument to use in connection with the syringe to remove any débris that may be under these folds. If this precaution to cleanse the affected and contiguous parts is not taken, any infection that may be present will be carried by the instrument used into areas that are not involved. After the area around the tooth has been cleansed with the syringe and probe in the manner mentioned, the parts should be wiped clean with cotton or gauze and a nonirritating antiseptic solution.

Sterilizing Instruments.—Instruments should be effectively sterilized in an instrument sterilizer immediately after their use, and be kept scrupulously clean after sterilization. Any annoying delay at the time of operation may, however, be avoided by having the necessary instruments continually in the process of sterilization. To accomplish this purpose, the author has had metal racks made on which the instruments for impacted third molar work are systematically arranged for immediate use. After the instruments have been properly sterilized in the instrument sterilizer, they are hung on the racks, which are placed in a high-pressure steam sterilizer of the autoclave pattern, with the steam pressure in the outer chamber adjusted to maintain such even heat in the inner chamber as to keep the instruments at a proper temperature. As soon as the operating field has been prepared, the racks are taken out of the autoclave, and the instruments, while on the racks, are chilled with sterile water from a high-pressure water sterilizer and then immersed in alcohol. By this method is avoided the trouble usually had in chilling the handles of the larger instruments, which retain heat for a greater length of time than the handles of the smaller ones. The racks of instruments, which are then in a condition to be easily handled, are taken into the operating room on an accessory carriage. The instruments not hung on the racks are, after sterilization, placed in separate sterilized cloth holders and kept ready for use.

Sterilizing Dressings.—All linens, absorbent cotton, gauzes, towels and other materials should be thoroughly sterilized in an autoclave preceding an operation.

Sterile Protection for Operator and Patient.—The operator's gown should be in a sterile condition, and the head of the patient should be protected with a sterilized linen head covering.

Sterilizing Hands and Forearms.—The hands and forearms of the operator should be put in a sterilized condition. This may be accomplished by scrubbing them thoroughly with sterilized green soap in running water, to be followed by an application of alcohol. In addition to this scrubbing, the operator should wear rubber gloves for complete protection. The wearing of gloves may at first appear awkward, but this feeling will be overcome in a short time, when the gloved hands will be used in a natural manner, as there will be no loss of the sense of touch.

Stabilizing the Mandible.—When extracting an impacted mandibular third molar with an exolever, the pressure that may be exerted with the instrument can, in a measure, be counterbalanced by inserting, on the side of the mouth opposite to the one from which the tooth is to be extracted, an automatic rubber mouth prop, on which the patient is directed to bite during the operation, thereby stabilizing the mandible. When a general anesthetic is employed, such as nitrous oxide and oxygen, the automatic mouth prop is used to stabilize the mandible and to keep the mouth open during the administration of the anesthetic, so that it will not be necessary to force the mouth open after the patient has been anesthetized. The advantages of the automatic mouth prop are: (1) it is not readily displaced when pressure is applied to the mandible during the process of extraction; (2) it will not interfere with gaining access to the mouth; (3) it will not injure the teeth with which it comes in contact; (4) it will not wound the lips or cheek, and (5) it is readily removed on the completion of the operation.

In order to prevent the mouth prop from slipping, the occlusal surfaces of the maxillary and mandibular teeth with which the prop will come in contact are wiped dry with absorbent cotton and alcohol. The operator inserts the index and second fingers of the left hand into the mouth, drawing the cheek aside, and with the thumb and fingers of the right hand he inserts the prop, as shown in Fig. 365. When the prop is in position, as shown in Fig. 366, a slight pressure is applied downward on the mandible to determine whether the prop will remain in position. If it is found that the prop may slip from the surfaces to which it has been adjusted, it should be removed and the surfaces should be again wiped dry, so that during the operative procedure the operator will not be annoyed by having to stop to readjust the prop.

Where both mandibular third molars are to be extracted, two mouth props of the same size should be available. After the first tooth has been extracted, absorbent cotton is placed over the socket to absorb the blood while the operator is extracting on the opposite

Fig. 365. — Insertion of Automatic Mouth Prop. Showing fingers of left hand displacing lip and cheek, and right hand inserting prop.

side, but the amount of cotton should not interfere with the adjustment of the prop on the side on which the operation has taken place. When the prop has been placed in position on the side which has been operated on, the one on the opposite side is readily removed, and the same procedure adopted in the first extraction is followed.

INCISION OF THE GUM TISSUE

Incision of the gum tissue is made for the purpose of facilitating the application of, and the execution with, the instrument to be used for the extraction technic. The effect of lessening the work of the operative procedure by a preliminary incision will be to avoid mutilation of the parts with the extraction instrument, and to conserve as much as possible of the surrounding tissue, so that the latter may be in a condition to protect the second molar and the socket after extraction. When incising the gum tissue, the incision should be

made so as to be favorable for the technic to be applied and the style of ossisector and exolever to be employed. It has been the practice in the past to use a retractor to draw the gum tissue from over the impacted tooth, or to insert a suture through the tissue to serve that purpose. This procedure is now, however, made unnecessary by using the back of the blade of the ossisector or exolever to displace the tissue when applying the instrument, and, when it is taken away from the parts engaged, the flaps will fall back into position, which course is repeated with each application of the instrument. By this process the tissue is not subjected to any trauma, and the fluids of the mouth will not enter the operative field.

If an incision of the gum tissue is found necessary, it is important to determine the point of insertion. In many cases of vertical impaction, where the gum tissue does not cover the occlusal surface

Fig. 366. — Automatic Mouth Prop in Position. Automatic mouth prop in correct position, so that it will not be displaced when pressure is applied to opposite side.

Fig. 367. — Position of Patient and Operator—Right Side. Operator assumes a position to rear and slightly to right of patient when operating on right side of arch.

or where the tooth is in an angular position, no incision may be necessary, and in such cases displacing the gum tissue with the instrument engaged on the mesial, distal or buccal surface will usually be sufficient for the operative procedure. If, however, displacing the gum tissue is not practicable, an incision sufficient to allow the extraction of the tooth without causing unnecessary trauma should be made, and the incision should be made in conformity with the technic that is to be followed.

Extraction of Maxillary and Mandibular Third Molars.—Where the maxillary and mandibular third molars on the same side of the arch are to be extracted, and the supporting ossistructure around both molars is found to be infected, it is advisable that the two teeth be extracted on different days, and that the maxillary molar be extracted first, as drainage takes place more readily in the upper than

in the lower arch. If this procedure is not followed, and the mandibular molar is extracted first, there is a liability of the socket of the mandibular molar becoming reinfected from the socket of the maxillary molar.

POSITION OF THE PATIENT AND OPERATOR

In order to obtain convenient access to the posterior part of the mouth, to be able to excise such ossistructure as may be necessary, to secure the proper application of the exolever, and to execute the required exolever movements, it is essential that the relative positions to be assumed by the patient in the chair and the operator receive

Fig. 367*A*. — Position of Patient and Operator—Right Side. Supporting mandible with left hand, and applying exolever to third molar on right side of arch.

Fig. 368. — Position of Patient and Operator—Left Side. Operator faces patient when operating on left side of arch.

careful attention. The positions here described have been found to be the most practicable that experience has suggested, and will enable the operator to obtain satisfactory results.

Position of Patient.—The standard form of dental chair is best suited for the operation, and should be adjusted to its low position. A headrest with some degree of rigidity is to be preferred. The footrest should be of such construction as to allow the patient to place his feet flat on the rest and not at an angle, especially if the patient is to be given a narcotic of nitrous oxide and oxygen; or the footrest may be removed entirely from the chair and the patient's feet placed firmly on the floor. The patient's legs should be relaxed and not crossed. He should sit erect, with the head in line with the axis of the body. The chair should be so adjusted that the body will be thoroughly supported, both as to the back and the head, when the muscles are relaxed, and free

breathing maintained. The position of the body is seldom changed during the operative procedure. The headrest should be so constructed as to be easily adjusted and to allow the arm of the operator to be readily placed around the head of the patient to assist in supporting the mandible when the nature of the operation requires such support. The arms of the patient should be relaxed, with the hands lying loose in his lap. If, however, the patient is of a nervous temperament, the operator may instruct him to clasp his hands.

Position of Operator for Operation on Right Side.—For operating on the right side of the patient, the back of the chair should be in an

Fig. 368 *A*. — Position of Patient and Operator—Left Side. Supporting mandible with left hand, and applying exolever to third molar on left side of arch.

upright position, with the patient sitting erect. The chair is tilted back at an angle of about 45°; the operator assumes a position in the rear and slightly to the right of the patient, and steps upon an operating stool for elevation (Fig. 367). This position places the upper part of the body of the operator directly over the head of the patient, does not interfere with light, and allows convenient access to the impacted mandibular third molar on the right side of the arch (Fig. 367 A). In this position such direct pressure as may be necessary to excise the ossistructure with the ossisector can be conveniently applied, and the exolever technic can also be readily executed.

Position of Operator for Operation on Left Side.—For operating on the left side of the patient, the position of the patient in the operating chair is the same as when operating on the right side. The chair is not tilted back as for operating on the right side, but should be in an upright position, so that the mandible is brought as closely as possible to the operator in order to gain access for excision of the ossistructure on the distal surface of the third molar and to permit ready access to the mesial and buccal surfaces of this tooth with the exolever (Fig. 368). If the operator is ambidextrous, he assumes the same position as that described for operating on the right side. If, however, he is not able to use both hands with equal facility, he assumes a position on the floor or on an operating stool at the right of and facing the patient in order to apply properly the ossisector and exolever (Fig. 368 A).

The position for operating on the left side is not so favorable for excision of the ossistructure or executing the exolever movements as is the position back of the patient when operating on the right side. This condition has made it necessary to design instruments for the right and left sides respectively.

CHAPTER XVI

Operative Technic in Vertical Impaction

WHERE it is shown by the clinical examination and radiographic interpretation that the mandibular third molar is impacted in a vertical position, the technic for extraction, when such a procedure is indicated, should be executed in conformity with the position of the tooth, its root formation, its supporting ossistructure and its relation to the second molar. While the impacted tooth is described as being in a vertical position, the buccal surface of the crown may be in alignment with the corresponding surface of the second molar, or the tooth may be deflected buccally, lingually or buccolingually, and in an occasional case there may be a torsional deflection. The vertical type of impaction is frequently seen in practice.

It was found, during the prosecution of research work in connection with the extraction of the impacted mandibular third molar, that an exolever of a design that can be properly applied to the tooth in the various positions that it may assume will reduce the trauma that is usually associated with the extraction of this tooth when forceps are employed. The objection to the use of forceps is that it is difficult to apply properly both beaks of this instrument to the crown, as in the majority of cases the gum tissue that usually covers the crown must be displaced with the beaks, which procedure is almost impossible without making extensive excision or causing considerable trauma. In addition to this complicated condition, it is difficult to obtain a secure adjustment with the forceps on the crown of the impacted tooth, and the ossistructure on the lingual and buccal surfaces, when it extends beyond the gingival third, will be an interfering factor.

Where forceps are to be used in extraction, it is necessary to excise the ossistructure on both lingual and buccal surfaces, a procedure which is unnecessary where the exolever is employed. Where forceps are adjusted, the extraction movements cannot be executed in conformity with the root formation, and in such cases a fracture of the crown or roots frequently occurs.

It has been demonstrated that an exolever can be applied to an impacted mandibular third molar with very little trauma, as the gum tissue can be more readily displaced with the blade of the exolever than with the beaks of the forceps. When using the exolever, the extent of excision of the ossistructure is limited to a definite area, and

this will permit the proper application of the instrument and will allow the exolever movements to be made in conformity with the root formation.

It was also found that cases in which both roots were inclined distally were more frequently seen in a vertical type of impaction than in any other type, but it was not the predominating type of root formation. Where the radiogram shows such a root formation, the exolever movements are made in conformity with the distal inclination in order to avoid a fracture of the crown or roots. More extensive excision of the ossistructure on the distal surface is indicated in this type of root formation than in any other type in a vertical impaction.

A mesial root inclined distally and the distal root straight is frequently seen, and in such a case excision on the distal surface is not made so extensively as where both roots are inclined distally. The exolever movements are not made so far distally as where both roots are inclined distally on account of the liability of fracturing the straight distal root.

A mesial root inclined distally and the distal root inclined mesially is frequently seen, and in such a case excision on the distal surface is not made so extensively as where both roots are inclined distally. The excision should, however, be sufficient to permit the tooth to be directed distally far enough to fracture the septum between the roots, which will be quite a resisting factor.

Where both roots are straight or fused often no excision is indicated on the distal surface.

For the purpose of describing systematically the technic in the various types of vertical impaction of the mandibular third molar, the following classification is used:

1. No deflection, with the mesial surface accessible
2. No deflection, with the mesial surface inaccessible
3. Buccal deflection, with the mesial surface accessible
4. Buccal deflection, with the mesial surface inaccessible
5. Lingual deflection, with the mesial surface accessible
6. Lingual deflection, with the mesial surface inaccessible
7. Buccolingual deflection, with the mesial surface accessible
8. Buccolingual deflection, with the mesial surface inaccessible
9. Torsional deflection, with the surface that would normally be the mesial surface accessible
10. Torsional deflection, with the surface that would normally be the mesial surface inaccessible
11. Isolated position, with the mesial surface accessible
12. Isolated position, with the mesial surface inaccessible

NO DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

A very common type of impaction is where the tooth is in a vertical position, with the buccal and lingual surfaces of the third molar in alignment with the corresponding surfaces of the second molar and the mesial surface accessible to the application of the exolever. There is a variation in the distance between the occlusal surface of the third molar and the corresponding surface of the second.

CLINICAL EXAMINATION

Exposed Crown.—A part of the occlusal surface of the third molar may be exposed through the gum tissue. When a part is exposed, the alignment of the buccal and lingual surfaces should be compared with the corresponding surfaces of the second molar (special note being taken of any lingual inclination) to check the radiographic interpretation.

Gum Tissue.—Areas ranging in extent from a part of to the entire occlusal surface may be covered by gum tissue, and there may be débris and pus under the gum tissue folds.

RADIOGRAPHIC INTERPRETATION

Crown.—The enamel cap and pulp chamber are definitely outlined, and no part of the occlusal surface is visible. The mesial surface of the third molar does not show an overlap upon the distal surface of the second molar, and this condition should be checked with the clinical examination. There is a normal contact between the first and second molars. The radiographic interpretation indicates that there is no deflection of the buccal or lingual surface of the crown of the third molar from the corresponding surfaces of the second molar. On rare occasions, where there is quite a space between the mesial surface of the third molar and the distal surface of the second, a slight buccal deflection may exist, and this condition cannot be ascertained by a lingual radiogram, but may be determined by the clinical findings or by an occlusal radiogram. Where the occlusal surface of the third molar is quite a distance from the corresponding surface of the second, and the mesial surface of the mesial root is in contact with the distal root of the second molar, there is a possibility of a slight buccal deflection, in which case the condition should be checked by an occlusal radiogram. The occlusal surface of the third molar may be in alignment with or some distance below the corresponding surface of the second molar.

Roots.—The character of the root formation will govern the exolever technic and will also determine the extent of excision of the ossistruc-

ture on the distal surface. The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root inclined mesially, 18; mesial root inclined distally and distal root straight, 17; both roots inclined distally, 10; divergent roots, 10; partially developed roots, 8; both roots straight, 7; fused roots, 5, and mesial root straight and distal root inclined mesially, 2.

Ossistructure.—In some cases the buccal, lingual and distal surfaces are free of ossistructure to the gingival third. The normal resistance that would be presented on the distal surface is usually decreased by a pathologic condition, which has affected the ossistructure to the gingival third.

In some cases pathologic changes have not destroyed the ossistructure on the distal surface to an extent that will permit the exolever movements to be made to direct the tooth distally, and this condition is therefore an interfering factor.

In some cases the ossistructure on the distal surface extends beyond the gingival third and often up to the occlusal surface, but is not involved by a pathologic condition. Unless this ossistructure is properly excised, it will be a resisting factor in the execution of the exolever movements. In some cases the ossistructure extends over the distoclusal surface.

There is a variation in the amount of ossistructure on the buccal surface, which may extend from the gingival third up to the occlusal surface. In some cases no excision on this surface is indicated, and in other cases excision is made to provide access for the exolever. In an occasional case, where a pathologic condition involves the ossistructure on the buccal surface and a suitable fulcrum cannot be obtained owing to this pathologic condition, excision on the buccal surface at, or slightly distal to, the bifurcation is indicated. In the majority of cases no excision on the mesial surface is indicated, as this surface is usually not involved from the occlusal surface down to the gingival third.

OPERATIVE TECHNIC

Gum Tissue Technic.—Incision of the gum tissue is necessary where the occlusal surface of the third molar is not entirely free of gum tissue. Where the gum tissue partially extends over the occlusal surface in that type of case where only a mesial application of the exolever is indicated, an incision is made distally along the center of the occlusal surface (Fig. 369 A). Where a mesial and buccal application of the exolever is indicated, the blade of the lancet is inserted under the flap over the occlusal surface, with the cutting edge directed distally. The

incision is made distally along the buccocclusal surface to a point that will permit excision of the ossistructure on the distal surface, when indicated, and allow the exolever to be adjusted to the mesial and buccal surfaces (Fig. 369 B).

Where it is observed that the gum tissue on the mesial surface is liable to be subjected to trauma by the application of the exolever, in addition to an incision distally along the buccal surface a slight incision of the gum tissue at the distobuccal surface of the second molar is made (Fig. 369 C). This incision will often involve the gum tissue protecting the gingival third of the second molar, the incision being started at the gingival margin and extended downward and buccally, but only far enough to permit the exolever to displace the

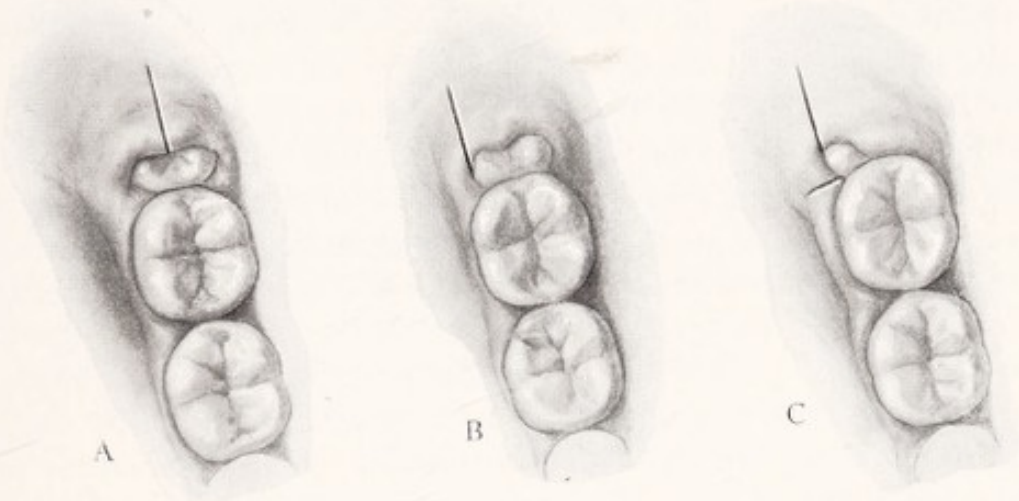


Fig. 369. — Incision of Gum Tissue—Vertical Impaction—No Deflection —Mesial Surface Accessible. *A*, incision distally along center of occlusal surface; *B*, incision distally along buccal surface; *C*, incision distally along buccal surface, downward and buccally at distobuccal surface of second molar.

gum tissue in order to reach the mesial surface. The flap will readily return to its original position. Where the gum tissue covers the entire occlusal surface of the third molar the incision is made as described for a vertical impaction where the mesial surface is inaccessible (page 387).

Ossistructure Technic.—The ossistructure technic described is not indicated for the use of forceps, but only for an exolever technic. In the type of impaction under consideration the mesial surface from the occlusal surface to the gingival third is free of ossistructure in the majority of cases, but in an occasional case it extends slightly beyond the gingival third toward the occlusal surface. As the tooth, in the greater number of cases, is not to be directed at once out of its socket in line with its long axis, the resistance of the root formation and the septum between the roots are first overcome by directing the tooth distally, in conformity with the root formation, to a point that will sepa-

rate the roots from the supporting ossistructure. In order that this movement may be possible, and that no resistance may be presented on the distal surface, excision of the ossistructure at this point is indicated in advance of any attempt to direct the tooth distally with an exolever. It was found that the ossistructure on the distal surface was not so dense as that on the buccal surface, and that, if an effort were made to gain access with the instrument, the ossistructure would permit ready excision. In the greater number of these cases the ossistructure had previously been involved by a pathologic condition which had weakened it.

Where the distal surface is free of ossistructure down to the gingival third as the result of a pathologic condition, usually no excision is indicated. The exception will be in that type of case where both roots are inclined distally and where the space between the distal surface and the ossistructure distal to this surface is not sufficiently involved by a pathologic condition to permit the tooth to be directed distally, in which case excision is indicated. In other cases, where there is only a slight pathologic involvement of the ossistructure on the distal surface and not sufficient to permit the execution of the exolever technic distally, excision is also indicated. In all cases where the ossistructure extends from the gingival third up to the occlusal surface and is not involved by a pathologic condition, excision should be made, for, if the operator were to attempt to direct the tooth distally by the application of the exolever to the mesial surface, the ossistructure on the distal surface would be a resisting factor, and a fracture of the tooth at its gingival third would follow. Excision on the buccal surface is indicated only in a case where the ossistructure will interfere with the application of the exolever to this surface and where it will improve the fulcrum. The amount of excision is governed by the root formation, the relation of the superior border of the ossistructure to the bifurcation of the roots, and the distance that the tooth can be directed out of its socket distally and upward by the application of the exolever to the mesial or mesiobuccal surface. The object is not to excise the entire buccal plate, a practice usually followed, but to excise only enough to allow the exolever to be adjusted to the buccal surface at the bifurcation, the ossistructure on this surface being utilized as a fulcrum when such a procedure is indicated. Where the ossistructure covers the entire distal surface, it may extend over the distoclusal surface, and is excised in advance of the ossistructure on the distal surface.

Distal Excision.—Where the radiographic interpretation indicates excision on the distal surface, the root formation, the distance that the ossistructure extends on this surface from the gingival third to

the occlusal surface and the exolever movements to be executed will govern the extent of the excision.

Where both roots are inclined distally, the excision on the distal surface should extend from the occlusal surface to the gingival third, with sufficient space on the distal surface to permit the tooth to be directed distally in order to overcome the curvature of the roots.

Where the mesial root is inclined distally and the distal root is straight, the excision on the distal surface will not be so extensive as where both roots are inclined distally, as the object to be attained is to direct the tooth distally far enough to overcome the distal inclination of the mesial root.

Where the mesial root is inclined distally and the distal root is inclined mesially, the distal excision is made to an extent to permit the tooth to be directed distally far enough to fracture the septum between the roots.

Where both roots are straight, the distal excision should be only sufficient to permit the tooth to be directed distally far enough to overcome the resistance of the peridental membrane and slightly loosen the tooth.

When the extent of excision has been fixed in the mind of the operator, the approach with the instrument for access to the area to be excised is an important factor in the execution of the technic.

Both Roots Inclined Distally.—Where the third molar is free of ossistructure on all four surfaces, with both roots inclined distally, the most favorable direction for extracting the tooth is distally. In such a case the ossistructure on the distal surface is examined for the purpose of determining whether there is sufficient space to direct the tooth distally when the exolever movements are applied.

In Fig. 389, page 372, the radiogram shows that the distal surface of the third molar is free of ossistructure, owing to a pathologic condition, down to the gingival third, but there is not sufficient space on the distal surface, and resistance of the ossistructure will be presented at this point, making excision necessary.

In Fig. 390, page 373, the ossistructure on the distal surface of the third molar is not so extensively destroyed by pathologic involvement as shown in Fig. 389, and this surface is not so free of ossistructure from the gingival third to the occlusal surface as usually prevails in those cases. This condition will not permit the tooth to be directed distally far enough to overcome the distal curvature of the roots, and excision on the distal surface is necessary in order to extract the tooth without meeting resistance in that region or risking the liability of fracturing the roots.

When the examination of the radiogram shows the condition pre-

sented in Figs. 389 and 390, the resisting ossistructure on the distal surface is excised, and, as the existing pathologic condition has weakened the structure, this excision is very readily made. Ossisector No. 1L for the left side or No. 1R for the right side (Fig. 350, page 303) is selected. The operator, assuming a position for the application of the ossisector, displaces the gum tissue, which has previously been incised, from over the occlusal surface with the back of the blade, and directs the blade toward the ossistructure to be excised, being governed in the movement by the interpretation from the radiogram. With the blade of the ossisector in this position, the cutting edge resting on the ossistructure, sufficient pressure is exerted to excise this structure. The amount of excision should be sufficient to permit the third molar to be directed distally far enough to overcome the distal curvature of the roots and eliminate the resistance in that region. The blade of the ossisector is directed distal to the part to be excised at a slight angle toward the tooth, and the instrument should always be under the full control of the operator. Excising toward the tooth minimizes the possibility of an accident.

An operator not accustomed to the use of an ossisector should execute the excision movements slowly, but according to the technic in the case, and, as he becomes familiar with the radiographic interpretation and acquires greater proficiency in the use of the instrument, he will be able to execute the technic more deliberately. Where the ossistructure is involved by a pathologic condition, as shown in Figs. 389 and 390, the excision is more readily executed, as the ossistructure is not very dense and is therefore readily penetrated. The excision is confined to the ossistructure on the distal surface and should not include the ossistructure buccal or lingual to the distal surface, as the latter excision is unnecessary and the structure is denser.

In Fig. 391, page 373, the ossistructure on the distal surface extends from the gingival third up to the occlusal surface and both roots are inclined distally. Any attempt to apply the exolever technic described for a case where there is pathologic involvement on the distal surface, notwithstanding the fact that the two types appear to be identical except for the distal ossistructure, will disconcert the operator, as he will meet great resistance on inserting the exolever into the interproximal space between the second and third molars, and, if too great pressure is applied, a fracture of the crown is liable to occur. In order to avoid a possible fracture, the ossistructure on the distal surface is excised down to the gingival third.

In Fig. 370 A is shown ossisector No. 1R displacing the gum tissue

over the occlusal surface where the incision has been made distally over the center of the occlusal surface; in Fig. 370 B is shown the ossisector blade used to displace the gum tissue over the occlusal surface where the incision has been made in a case where the entire crown is covered by gum tissue.

After the gum tissue has been displaced from over the occlusal surface the ossisector blade is directed toward the distal end of the incision, as shown in Fig. 371 A. The blade is then turned so that the back will displace the gum tissue distal to the distal surface, and the cutting edge of the blade is directed toward the ossistructure to be excised (Fig. 371 B) and Fig. 371 C shows the blade of ossisector No. 1L applied on the left side.

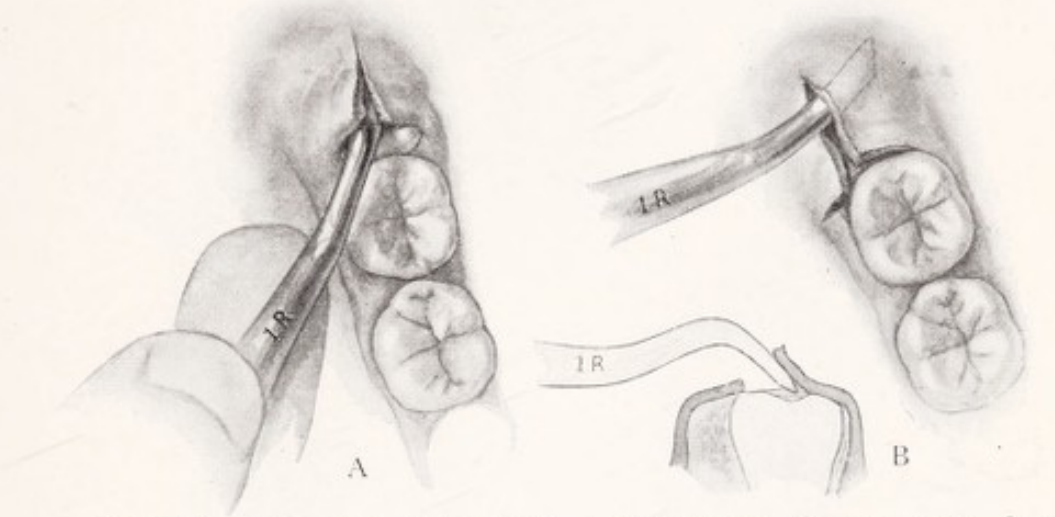


Fig. 370. — Displacing Gum Tissue over Occlusal Surface with Ossisector Blade—Vertical Impaction—No Deflection. *A*, gum tissue over occlusal surface displaced with back of blade of ossisector No. 1R, where incision has been made distally over center of occlusal surface; *B*, gum tissue displaced over occlusal surface when it extends over this entire surface.

After the gum tissue has been displaced with the back of the blade, the distobuccal surface is used as a guide to locate the distal surface where the ossistructure extends to the occlusal surface, and where this condition does not exist and part of the distal surface is free of ossistructure, the blade is then directed toward the center of the distal surface.

In Fig. 372 A is shown ossisector No. 1R applied to the ossistructure on the distal surface on the right side where the occlusal surface is located a short distance from the corresponding surface of the second molar; in Fig. 372 B is shown the blade of the ossisector when applied to the left side; in Fig. 372 C is shown the extent of incision usually indicated, and in Fig. 372 D is shown the blade applied where the occlusal surface of the third molar is located quite a distance from the corresponding surface of the second molar. Where the operator initially experiences difficulty in penetrating the

ossistructure, he may by turning the handle of the instrument to the right or left with a gouging movement penetrate the structure to such an extent that further excision will be permitted.

When an examination was made of the ossistructure supporting the tooth, it was found that the cortical plate on the buccal surface was very difficult to excise on account of its density. In the majority of cases the cortical plate distal to the distal surface is not difficult to penetrate in order to reach the cancellous structure which

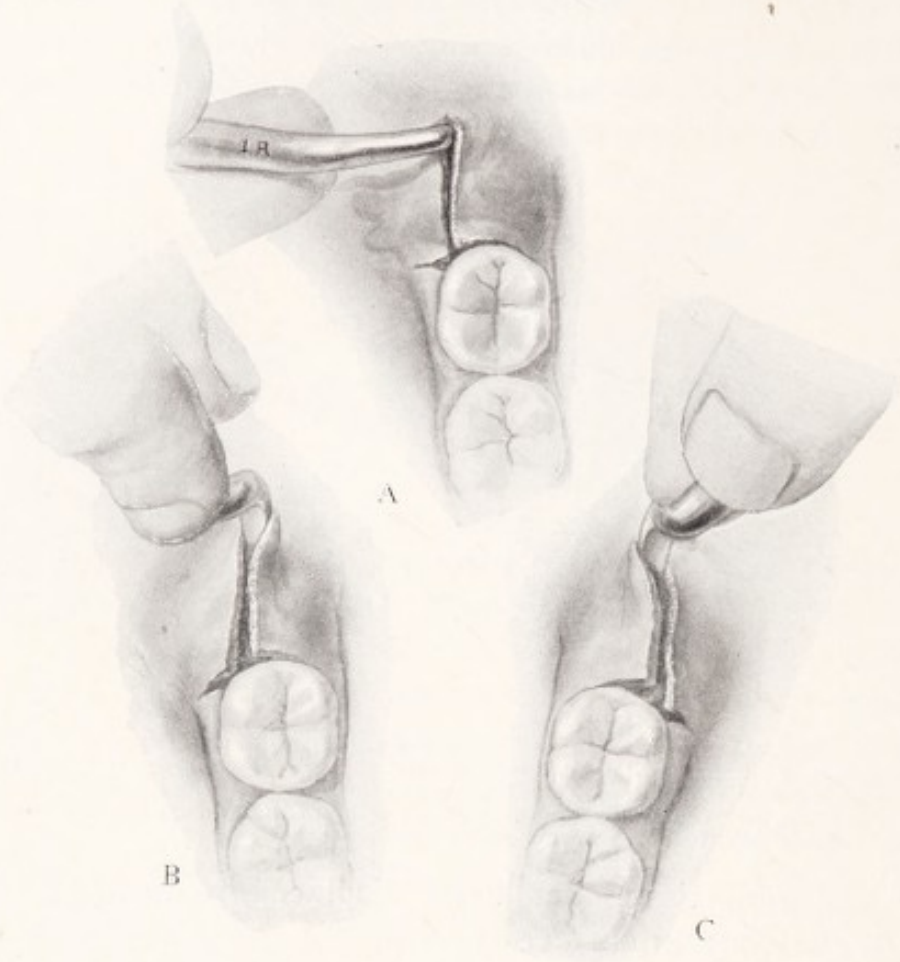


Fig. 371.—Displacing Gum Tissue with Ossisector Blade when Excising Ossistructure on Distal Surface—Vertical Impaction—No Deflection. *A*, blade of ossisector No. 1R inserted beneath gum tissue and distal to end of incision on distal surface of third molar; *B*, blade turned for a distal excision of ossistructure on right side; *C*, blade in position for a distal excision on left side.

is underneath, and it is not difficult to excise. The excision of the ossistructure on the distal surface, on account of the character of the structure, will not be as clean as where the structure is dense. When the ossisector has penetrated the cortical plate and the cancellous structure is being excised, the latter will crumble and the excision will be made in the manner of gouging out the resisting parts, which should be removed with the blade of the instrument. Penetrating the thin cortical plate may appear difficult to one not accustomed to such a procedure, but, with an instrument designed

to reach the affected area, it will not be so difficult. The operator who is accustomed to making this excision can readily execute it, but one who is not proficient in the technic should proceed slowly and carefully until he has fully mastered the use of the instrument.

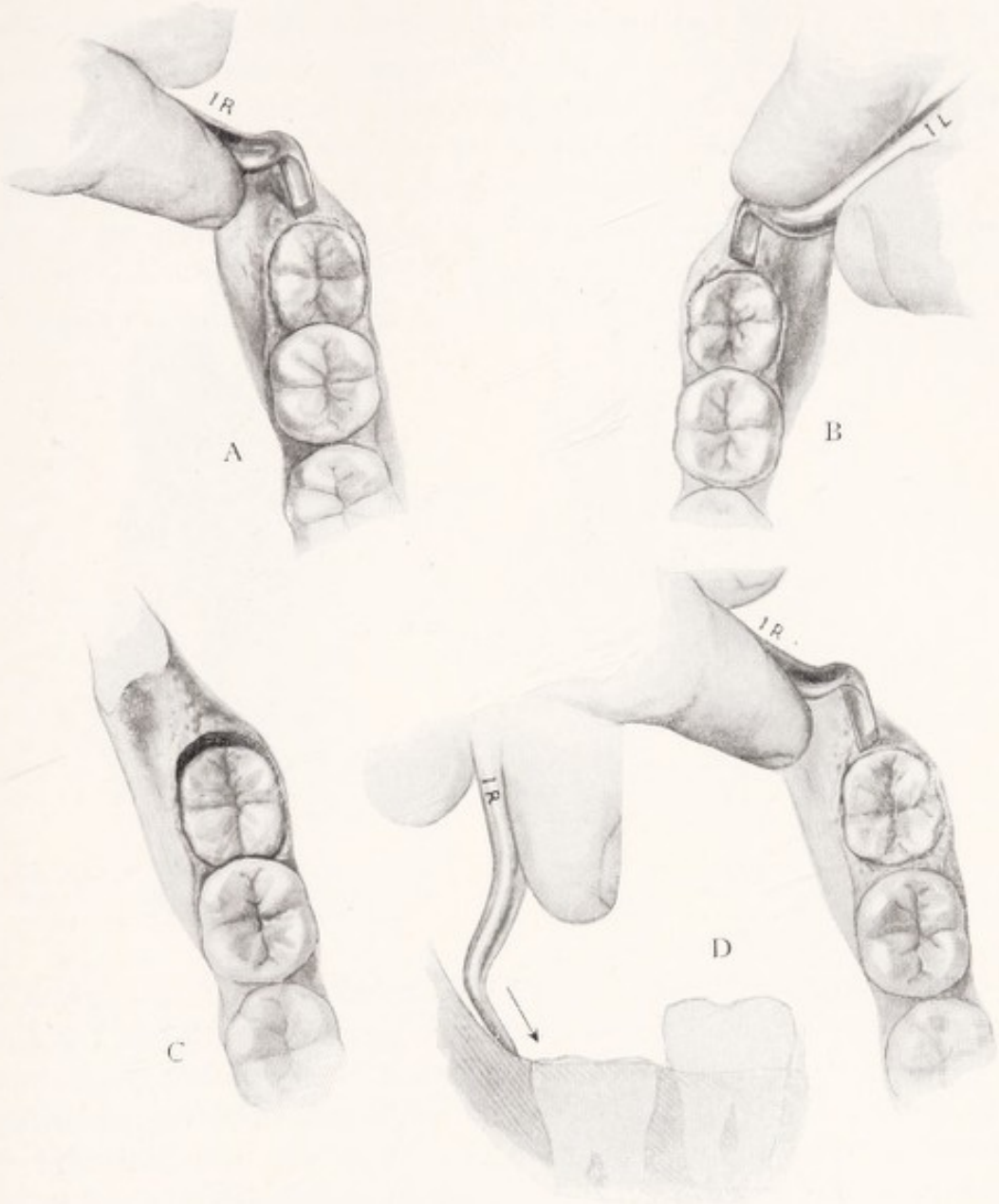


Fig. 372. — Distal Excision of Ossistructure—Vertical Impaction—No Deflection. *A*, ossisector No. 1R applied to ossistructure on distal surface on right side; *B*, ossisector No. 1L applied to ossistructure on distal surface on left side; *C*, extent of excision usually indicated; *D*, lingual and occlusal views of application of ossisector blade to distal surface on right side where occlusal surface of third molar is located quite a distance from corresponding surface of second.

Distolingual Excision.—Where the internal oblique ridge extends to the distolingual surface, in which instance ossisector No. 1L or No. 1R will not be suitable to excise through the ridge, an ossisector with a heavier blade is indicated. After the excision has been made on the distal surface with ossisector No. 1L or No. 1R, ossisector

No. 3L or No. 3R (Fig. 352, page 305) is indicated. When a pathologic condition is present on the distal surface or a space has been created by the excision, the blade of the ossisector should be applied along the distal surface of the second molar toward the ridge on the distolingual surface, as illustrated in Fig. 373, which shows the application of the ossisector blade on the right and left sides of the arch. The excision is then made with pressure under control toward the ridge. In a vertical impaction where there is extensive pathologic involvement on the distal surface and no excision is indicated by the radiographic interpretation, the ridge, where it extends up to the distolingual surface, may not be involved by a patho-

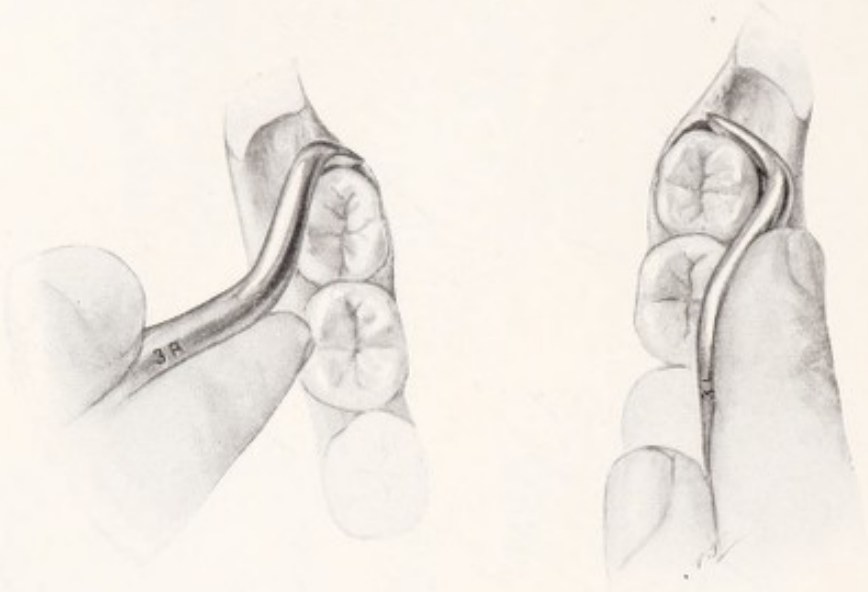


Fig. 373. — Distolingual Excision of Ossistructure—Vertical Impaction —No Deflection. Excision of ossistructure on distolingual surface where internal oblique ridge extends to distolingual surface, using ossisector No. 3R for right side and No. 3L for left side.

logic condition and is not often discernible in the radiogram, but will prove to be a resisting factor when the exolever technic is executed. In all of these cases it should be a routine procedure to apply the blade of the ossisector in the location of the distolingual surface in order to be sure that the ridge will not interfere with the exolever movements when directing the tooth distally and upward.

Mesial Root Inclined Distally and Distal Root Straight.—The condition of the ossistructure on the distal surface where the mesial root is inclined distally and the distal root is straight is similar to that described in the case where both roots are inclined distally, and the same technic is executed, except that it is not necessary to make the excision so extensive distally, as the tooth is not to be directed so far distally with the exolever.

Mesial Root Inclined Distally and Distal Root Inclined Mesially.—The condition of the ossistructure on the distal surface where the

mesial root is inclined distally and the distal root is inclined mesially is similar to that described where both roots are inclined distally, except that the excision is not so extensive, but should be sufficient to permit the tooth to be directed distally in order to fracture the septum between the roots.

Both Roots Straight or Divergent.—The condition of the ossistructure on the distal surface where both roots are straight or divergent is similar to that described where both roots are inclined distally, and the same technic is executed, except that it will not be necessary to make the excision so extensive distally, as the tooth is not to be directed so far distally with the exolever. Where a buccal application of the exolever is made independent of a mesial application, excision is not very often indicated on the distal surface.

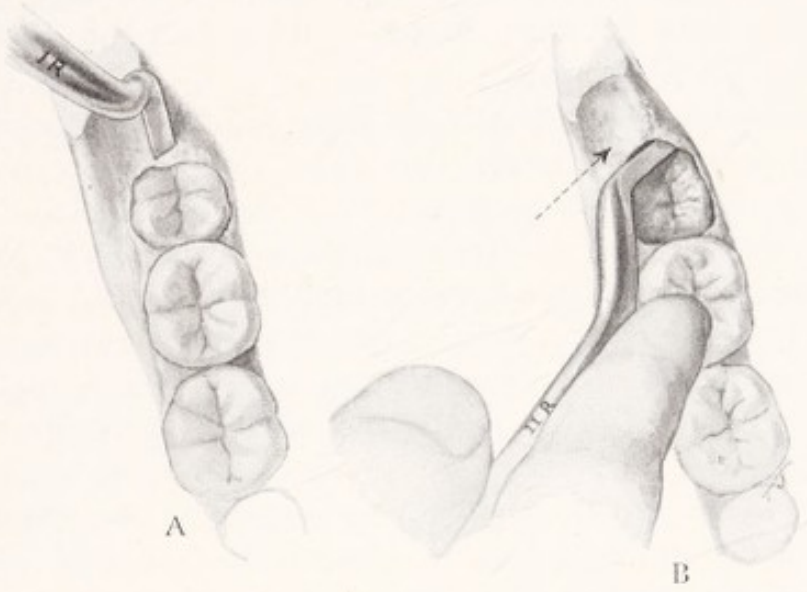


Fig. 374. — Distoclusal Excision of Ossistructure—Vertical Impaction —No Deflection. *A*, application of ossisector No. 1R, where ossistructure extends over distoclusal surface; *B*, application of ossisector No. 11R when excision of internal oblique ridge is indicated over distolingual and that part of occlusal surface which is covered by ossistructure.

Distoclusal Excision.—Where the ossistructure, in addition to extending over the entire distal surface, extends over the distoclusal surface, the ossistructure over the latter surface is excised in advance of the ossistructure on the distal surface.

In Figs. 398, 399, 400, 405, 406 and 411 (pages 377, 378, 379, 381, 382, 385) the ossistructure, which extends over the distoclusal surface, will prove a resistance if not excised in advance of the application of the exolever, and the excision is made with ossisector No. 1L for the left side or No. 1R for the right side. The gum tissue over the occlusal surface is displaced with the back of the blade, and the blade is directed to a point where it can be applied to excise the ossistructure over the distoclusal surface (Fig. 374 A). When the blade strikes the occlusal

surface, the contact with the enamel will dull the blade, and several instruments of the same design should be available, so that the instrument may be discarded when it becomes dull. No ledges should remain over the occlusal surface, as they will cause resistance, especially when they are near the buccoclusal or linguoclusal surface. Where the ossistructure extends over the distoclusal surface, repeated excisions are often necessary in order to excise all of the ossistructure over the involved surface. Where, on account of the density of the internal oblique ridge, the previously mentioned ossisector will not readily excise the ossistructure over the distolingual and that part of the occlusal surface which is covered by ossistructure, ossisector No. 11L for the left side or No. 11R for the right side (Fig. 360, page 313) is then used to excise the structure at this point by directing the blade between the ossistructure and the occlusal surface with pressure under control, and the part is readily excised (Fig. 374 B).

Buccal Excision at or Distal to Bifurcation.—In the majority of cases where both roots are inclined distally the tooth can be directed out of its socket by the application of the exolever to the mesial surface for the purpose of directing the tooth distally, provided the ossistructure on the distal surface has been excised sufficiently to permit such movement. Where the roots are not so inclined, it becomes necessary in the greater number of cases to make the final application of the exolever to the buccal surface at the bifurcation in order to avoid a fracture of the roots and to extract the tooth, after it has been loosened and directed distally, by the application of the exolever to the mesial or mesiobuccal surface. Where the radiogram shows the buccal surface to be free of ossistructure from the occlusal surface down to the gingival third, usually no excision is indicated. Where the tooth, by the application of the exolever to the mesial or mesiobuccal surface, can be directed out of its socket distally and upward to a point where an adjustment can be made without interference of the ossistructure on the buccal surface at the bifurcation, excision is not indicated. The operator determines from the radiogram the location of the superior border of the ossistructure, and if (considering the character of the root formation, the location of the bifurcation and the distance that the tooth can be directed distally and upward out of its socket when the exolever movements are applied to the mesial or mesiobuccal surface) the ossistructure on the buccal surface at the bifurcation will be an interfering factor in the application of the exolever to the buccal surface, excision is indicated. The amount of excision will be regulated by the root formation, which governs the exolever technic, and the loca-

tion of the ossistructure on the buccal surface compared with the bifurcation of the roots.

Buccal excision is indicated in the cases shown in Figs. 391, 399, 406 and 411. The ossistructure in all of these cases extends over three-fourths of the buccal surface, leaving the remainder of the surface free of ossistructure. The depressed crown and the character of the root formation will not permit the tooth to be directed out of its socket, by the application of the exolever to the mesial or mesio-buccal surface, to a point that will allow the final application to be made to the buccal surface without interference of the ossistructure.

Ossisector No. 11L for the left side or No. 11R for the right side (Fig. 360, page 313) is selected, and, governed by the radiographic interpretation, the gum tissue over the buccal surface at the part of the crown free of ossistructure is displaced with the back of the blade. The blade is applied to the buccal surface at the junction of the ossistructure on this surface in order to determine if there is a space into which it can be inserted for the purpose of acting as a wedge. Where the roots are short or the septum between them is not of a large size, the latter procedure will often loosen or extract the tooth. If the application of the blade discloses a large space, no excision is indicated, and the exolever technic for a buccal application follows. Where there is not sufficient space for the blade to act as a wedge between the tooth and the ossistructure, a slight pressure applied to the handle of the ossisector, the blade being directed toward the interfering ossistructure, will create sufficient space if the structure is not very dense. Where, however, no space can be created, the blade is directed toward the buccal surface, and the excision is continued downward, and extended to a point slightly above the bifurcation of the roots. The excision should free the buccal surface distal to the bifurcation, as the tooth, when directed distally by the application of force to the mesial or mesio-buccal surface, will displace the bifurcation distally from its original position, and the bifurcation is the point to be reached with the exolever blade. Too much excision is to be avoided, as it will decrease the value of the ossistructure on the buccal surface as a fulcrum, and insufficient excision will not allow a proper application of the exolever, so that an excision governed by the existing condition will be required.

Where both roots are straight and the tooth is not to be directed distally, the excision is then made in alignment with the bifurcation.

In Fig. 375 A is shown the blade of the ossisector displacing the gum tissue on the buccal surface in alignment with the bifurcation on the right side; in Fig. 375 B is shown the extent of excision that

would be indicated in alignment with the bifurcation, and Fig. 375 C shows the incision distal to the bifurcation.

In Fig. 376 is shown the ossisector applied to the right and left sides, viewed from the occlusal and buccal surfaces.

Where the ossistructure on the buccal surface is involved by a pathologic condition, as shown in Fig. 412, page 385, excision is indicated in order to secure a suitable fulcrum on the buccal surface, and the excision is made with the ossisectors mentioned above. The gum tissue on the buccal surface is displaced with the blade of the ossisector, and the blade is directed distal to the bifurcation. When

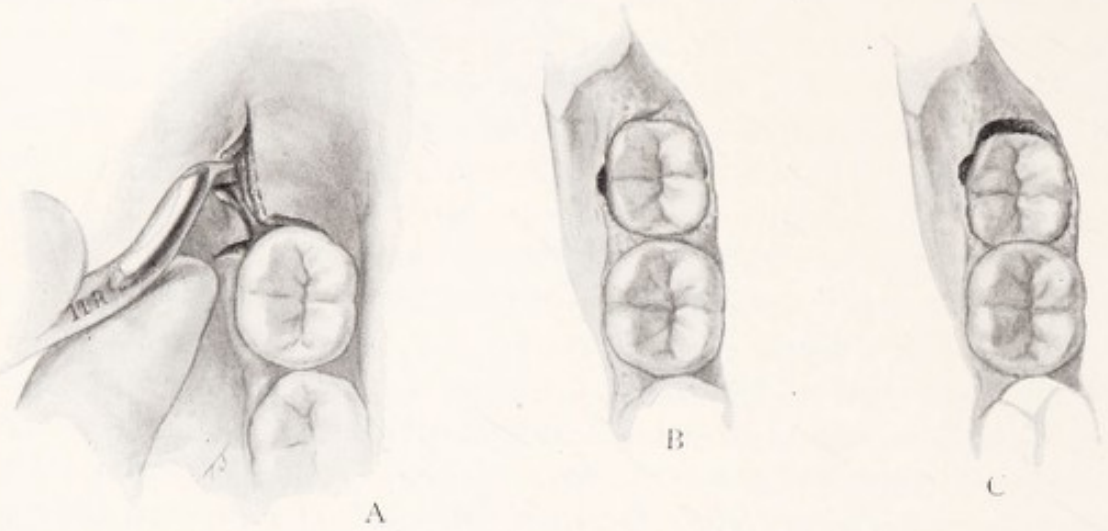


Fig. 375. — Buccal Excision of Ossistructure at or Distal to Bifurcation —Vertical Impaction—No Deflection. *A*, blade of ossisector No. 11R displacing gum tissue on buccal surface in alignment with bifurcation after incision has been made where tissue extends over entire occlusal surface; *B*, extent of excision, when indicated, in alignment with bifurcation; *C*, extent of excision, when indicated, distal to bifurcation.

the blade has reached the involved ossistructure, an excision is made toward the buccal surface, extending downward to where structure is reached which has sufficient strength to serve as a fulcrum. As the location of the excision on the buccal surface is governed by the exolever movements to be made when the tooth is to be directed distally and upward by the application of the exolever to the mesial or mesiobuccal surface, the operator must judge from the interpretation of the radiogram the approximate location of the excision distal to the bifurcation, so that no unnecessary excision is made. Where both roots are straight and the exolever is not to be applied to the mesial or mesiobuccal surface, the excision is made at the buccal surface at that point of the superior border of the ossistructure above the approximate location of the bifurcation. Where there is no pathologic condition present and where the ossistructure extends on the buccal surface up to the occlusal surface, it may be so dense as not to permit the previously mentioned ossisectors, with pres-

sure under control, to penetrate the structure, especially where the external oblique ridge extends along the buccal surface. In such a case ossisector No. 12L or 12R (Fig. 361, page 314) is used to penetrate through the dense cortical plate at the superior border of the ossistructure.

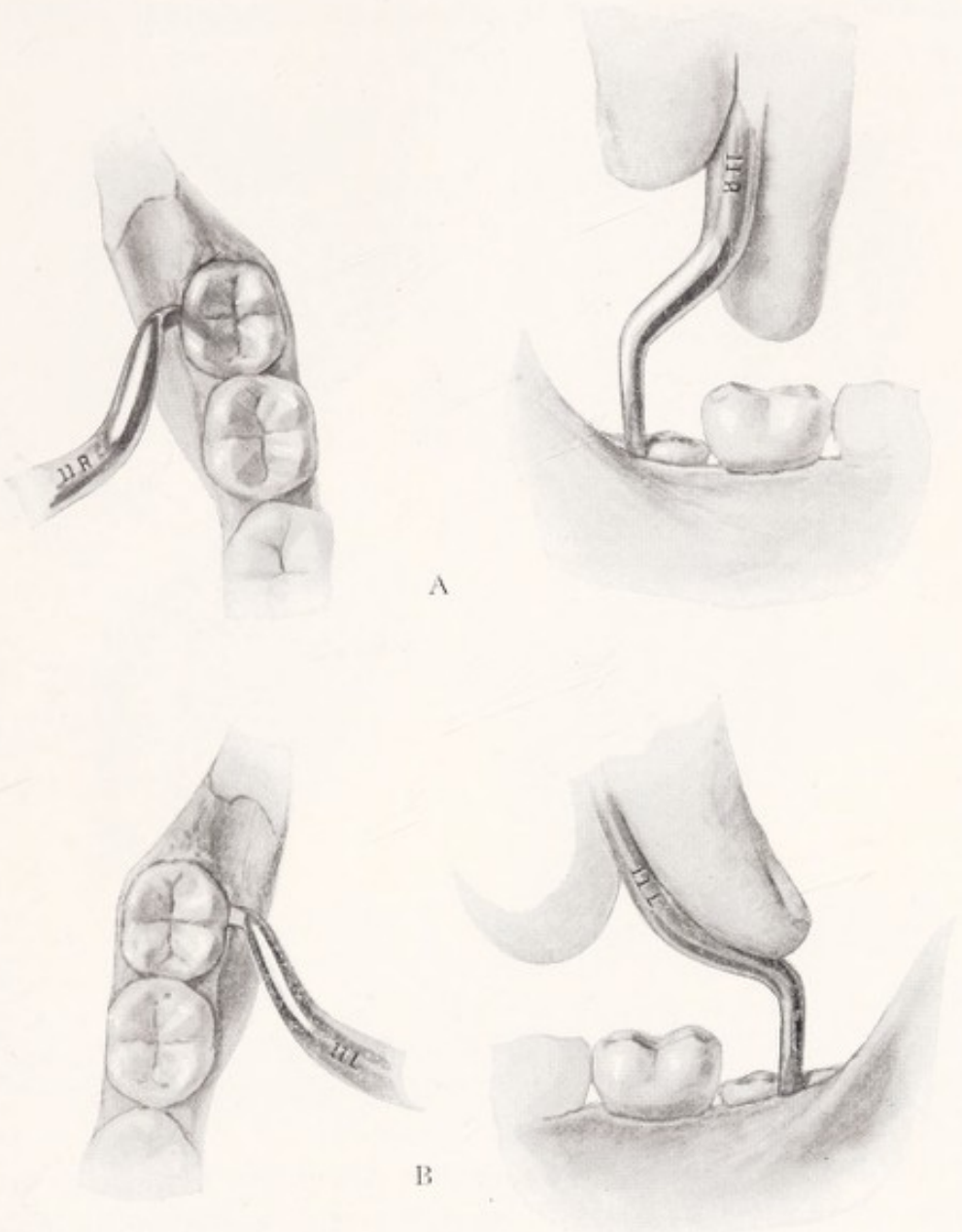


Fig. 376. — Buccal Excision of Ossistructure—Vertical Impaction—No Deflection. *A*, position of ossisector No. 11R when applied for excision on right side, giving a view of occlusal and buccal surfaces; *B*, application made on left side with ossisector No. 11L, giving a view of occlusal and buccal surfaces.

The gum tissue over the buccal surface at that part of the ossistructure in approximately vertical alignment with the bifurcation of the roots of the third molar or distal to the bifurcation is displaced with the back of the blade. The point of the blade is applied to the superior border of the ossistructure, and with pressure under

control a mesial or distal movement is executed, gouging through the dense cortical plate, and this will make a sufficient opening to permit the exolever blade to be applied to the buccal surface or will allow further excision with ossisector No. 11L or No. 11R.

In Fig. 377 A is shown an illustration of a radiogram where excision of the ossistructure on the buccal surface is indicated in align-

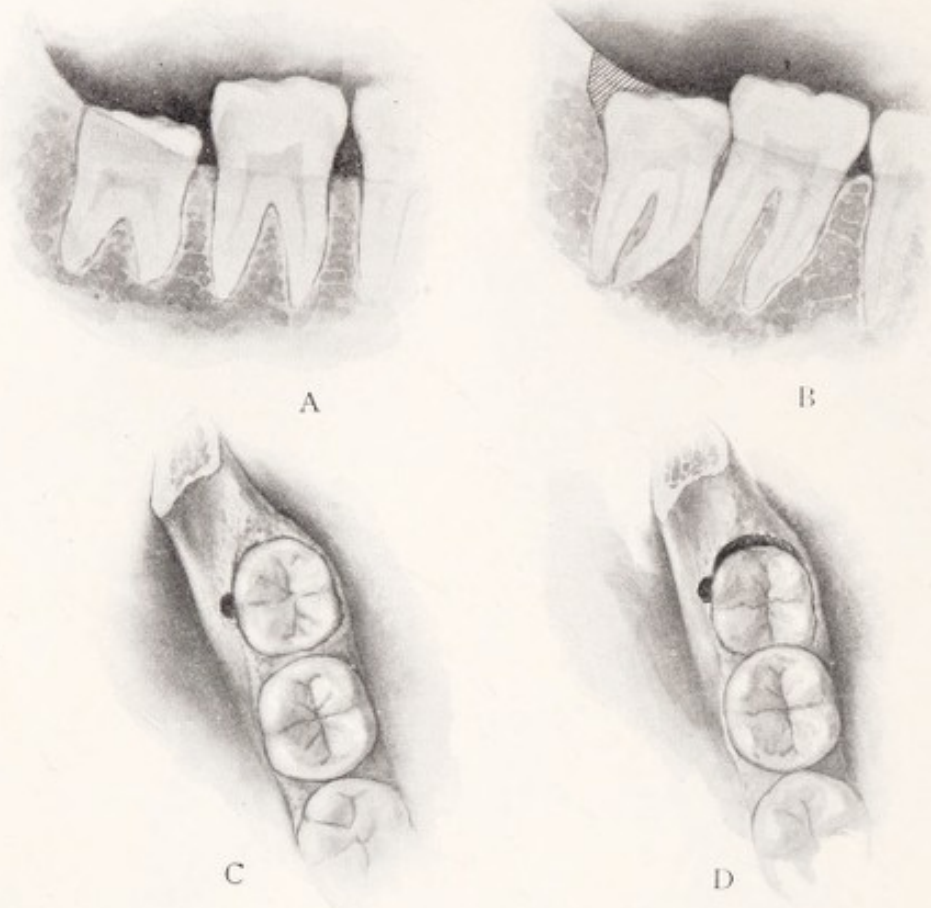


Fig. 377. — Buccal Excision of Ossistructure—Vertical Impaction—No Deflection. *A*, illustration of a radiogram where excision of ossistructure is indicated on buccal surface in alignment with bifurcation; *B*, illustration of a radiogram where excision is indicated on buccal surface distal to bifurcation; *C*, ossistructure on buccal surface penetrated in alignment with bifurcation; *D*, penetration distal to bifurcation.

ment with the bifurcation, and the type where it would be difficult to penetrate through the superior border of the ossistructure; in Fig. 377 B is shown an illustration of a radiogram where after the excision has been made on the distal surface excision on the buccal surface distal to the bifurcation would be indicated; in Fig. 377 C is shown the opening made in alignment with the bifurcation, and in Fig. 377 D is shown the opening made distal to the bifurcation.

In Fig. 378 A is shown ossisector No. 12R applied on the right side, viewed from the lingual, in alignment with the bifurcation; in Fig. 378 B is shown ossisector No. 12L applied on the left side, viewed from the lingual, in alignment with the bifurcation.

Exolever Technic—Both Roots Inclined Distally—Mesial Application.—Where the third molar is in a vertical position, with the mesial surface above the gingival third of the second molar, an approximately normal interproximal space and an approximately normal interseptum between the second and third molars, both roots being inclined distally, the exolever technic is the operative procedure indicated for the extraction of the tooth after the necessary excision of the ossistructure has been made. Where the roots of the third molar are short and not markedly inclined distally, exolever No. 1L for the left side or No. 1R for the right side (Fig. 333, page 283) is

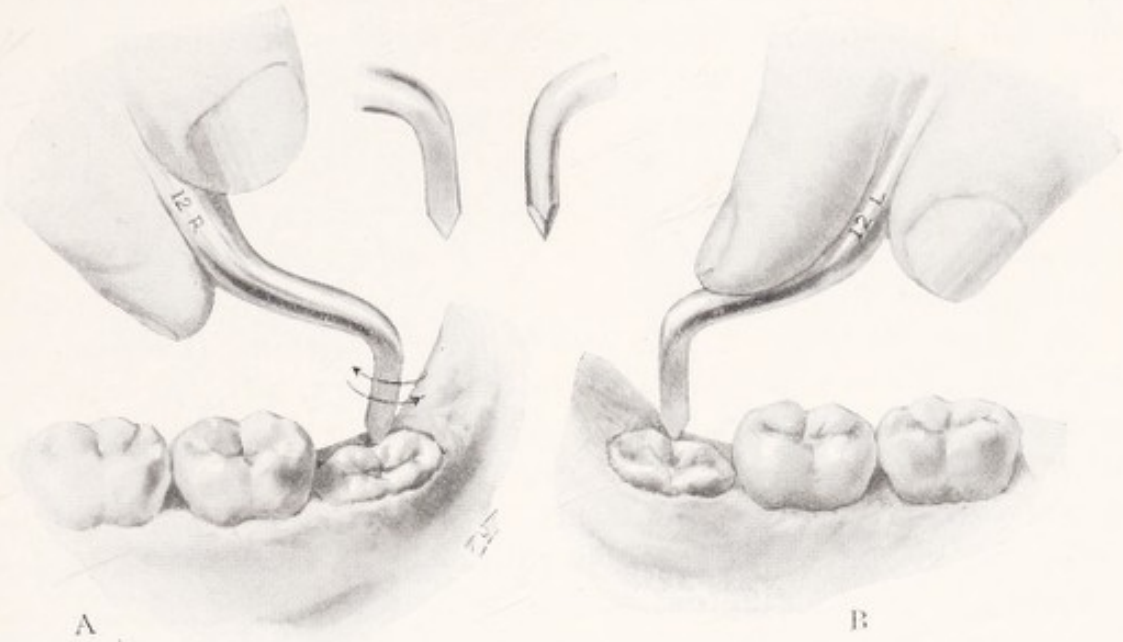


Fig. 378. — Buccal Excision of Ossistructure—Vertical Impaction—No Deflection. *A*, application of ossisector No. 12R used to penetrate through ossistructure on buccal surface on right side, viewed from lingual; *B*, application on left side.

indicated, and the exolever technic of applying the blade to the mesial surface, using the superior border of the ossistructure as a fulcrum, is followed as in the case where the mesial root is inclined distally and the distal root is straight (page 358). Where the roots are not as described above and are markedly inclined distally, the ossistructure will not be so good a fulcrum as the second molar. Where the latter tooth is not involved by caries or has a large filling on the distal surface and has not been restored by an artificial crown, exolever No. 2L or 3L for the left side or No. 2R or 3R for the right side (Figs. 334, 335) is indicated. After the clinical and radiographic examinations have been made of the size of the crown and the interproximal space has been determined, a blade that is slightly larger and whose point will readily enter the space is selected. Both roots being inclined distally indicates that

the extraction movements should be made so as to direct the tooth distally to avoid a fracture of the roots.

An examination is made of the second molar in advance of any operative procedure to determine the availability of that tooth as a fulcrum, as described on page 326. The exolever is held in the right hand, as shown in Figs. 347, 348, the operator assuming the position to gain access, as described on page 333, for either right or left side, and the gum tissue over the mesiobuccal surface is displaced with the back of the blade, when the blade is directed into the interproximal space between the second and third molars. The flat side of the blade is applied to the mesial surface of the third molar and the rounded side engages the distal surface of the second molar. The second molar, having been found available as a fulcrum, is used for that purpose. The blade, when inserted with pressure into the interproximal space, acts as a wedge, and is directed into the space as far as may be necessary to secure a good adjustment on the mesial surface of the third molar, with the distal surface of the second molar serving as a fulcrum. If the third molar is not firmly attached to the ossistructure, the initial application will, in many cases, be sufficient to loosen the tooth. If, however, the tooth is not loosened by this application, it is directed distally by turning the handle of the exolever mesially. In some cases during the exolever movements it may be advantageous to turn the handle distally, but turning the handle mesially is preferable unless conditions indicate a different procedure.

The tooth is directed as far distally as the first mesial turning of the handle will permit, taking into consideration the character of the root formation. If the first turning of the handle does not extract the tooth, the blade of the exolever is sent farther down into the space created between the second and third molars, and the turning of the handle is repeated. If the roots are markedly inclined distally and quite a space has been created by the first extraction movement, an exolever of the same design, but with a larger blade, is used, so as not to lose the fulcrum. The second application of the exolever will be the means of improving the fulcrum, as the first movement to direct the tooth distally created a space which decreased the supporting character of the first fulcrum. A repetition of the application of the larger blade may be necessary in case the roots are of an unusual length.

In case the tooth is loosened, the operator should be careful not to lose control of it and permit it to fall into the mouth. A good procedure after the tooth has been loosened to the point of extraction is to carry it forward with the exolever. Some operators, after

the tooth has been loosened, prefer to complete the extraction with pliers or forceps, but this is a matter of individual choice. An operator accustomed to the use of the exolever can, by applying the blade to the buccal surface, readily deliver the tooth out of the mouth.

In Fig. 379 A is shown exolever No. 2R displacing the gum tissue, after the incision has been made, from over the mesiobuccal surface in that type of case where the gum tissue extends over the entire occlusal surface; in Fig. 379 B is shown the exolever blade directed toward the mesial surface to be applied between the mesial surface of the third molar and the distal surface of the second.

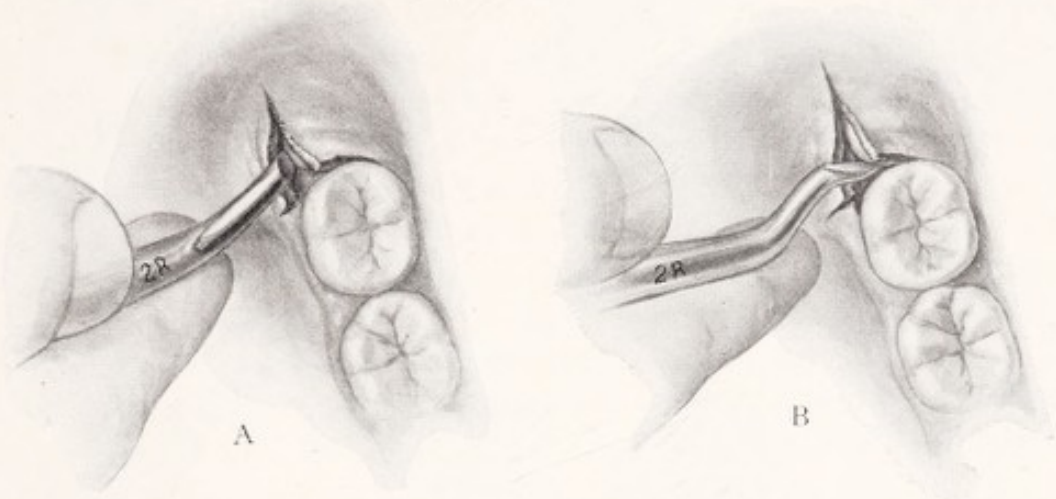


Fig. 379. — Displacing Gum Tissue with Back of Blade of Exolever—Vertical Impaction—No Deflection. *A*, back of blade of exolever No. 2R displacing gum tissue from over mesiobuccal surface where gum tissue extends over entire occlusal surface; *B*, blade directed toward mesial surface.

In Fig. 380 A is shown the initial application of exolever No. 2R between the mesial surface of the third molar and the distal surface of the second molar to be wedged between the two teeth; in Fig. 380 B is shown the blade wedged between the two teeth, the handle being turned to a slight extent mesially, with the flat side of the blade engaging the mesial surface of the third molar and the back of the blade resting on the distal surface of the second molar as a fulcrum, the tooth having been directed to a slight extent distally and upward; in Fig. 380 C is shown the blade turned to an extent where it has directed the tooth farther distally and upward, and in Fig. 380 D is shown the blade reapplied and engaging the third molar farther down on the mesial surface.

Where the mesial surface is at or below the gingival third of the second molar, or in that type of case where the mesial root of the third molar is in contact with the distal root of the second, no attempt should be made to apply the exolever to the mesial surface, with the distal root of the second molar being utilized as a fulcrum, as the latter

root is not suitable for that purpose and may be fractured when used to support the exolever blade. Exolever No. 9L for the left side or No. 9R for the right side is indicated for a mesiobuccal application, and the exolever technic is executed as described for a mesiobuccal application (page 368). Where the roots are of extreme length and

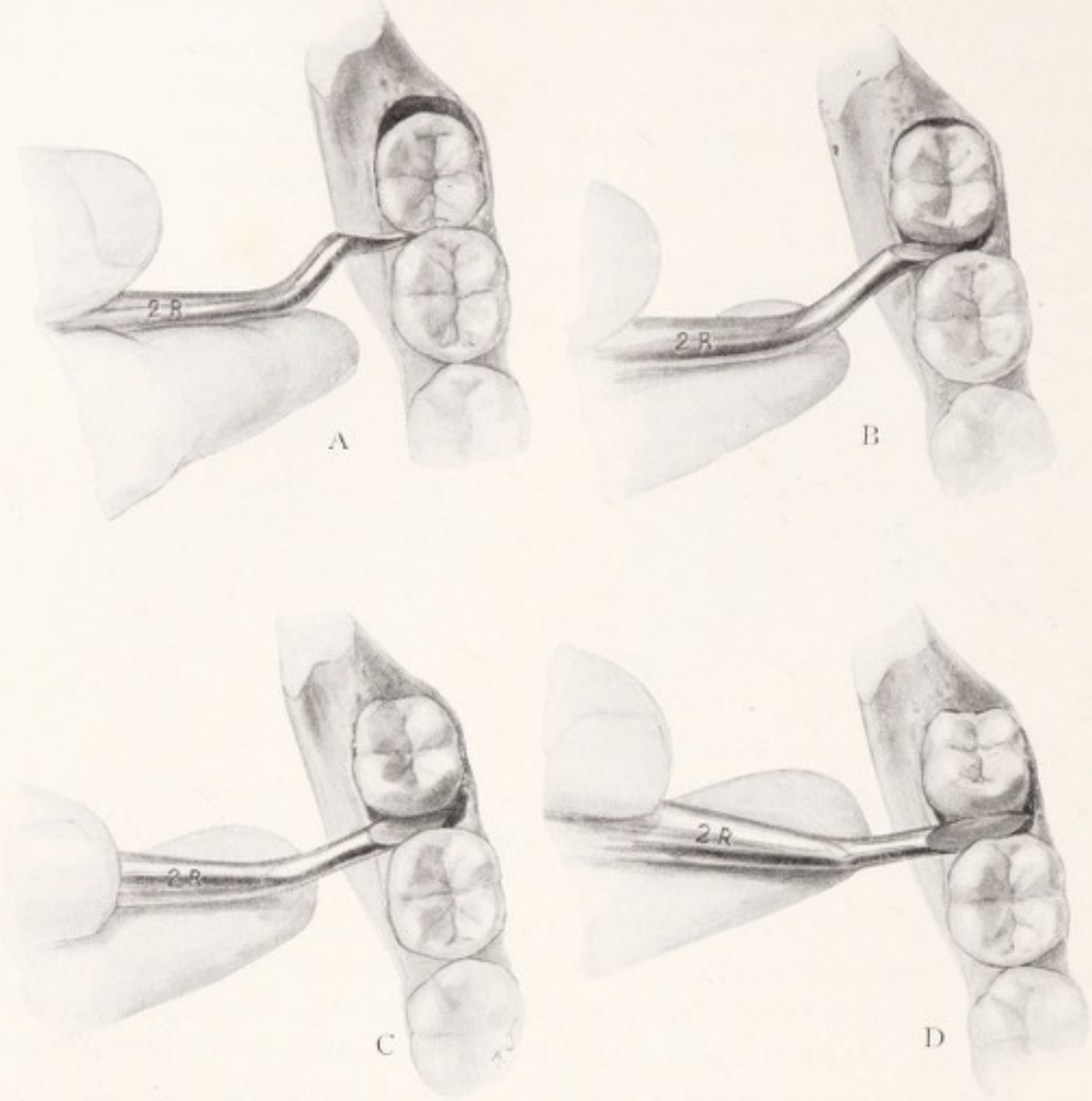


Fig. 380. — Mesial Application of Exolever—Vertical Impaction—No Deflection. *A*, initial application with blade of exolever No. 2R between mesial surface of third molar and distal surface of second in order to wedge blade between the two teeth; *B*, blade wedged between the two teeth, with flat side of blade engaging mesial surface, and back of blade resting upon distal surface of second molar, handle being turned to a slight extent mesially, tooth having been directed to a slight extent upward and distally; *C*, blade turned mesially to an extent where tooth has been directed farther upward and distally; *D*, blade reapplied and engaging third molar farther down on mesial surface.

the mesiobuccal application of the exolever has directed the third molar out of its socket to a distance where the distal surface of the second molar can be used as a fulcrum, this course is then followed to improve the fulcrum, and exolever No. 2L, 2R or No. 3L, 3R is used to direct the tooth farther out of its socket.

Mesial Root Inclined Distally and Distal Root Straight—Mesial Application.—Where the third molar is in a vertical position, with

the mesial surface above the gingival third of the second molar, where there is an approximately normal interproximal space and a normal interseptum between the second and third molars, and where the mesial root is inclined distally and the distal root is straight, the exolever technic is the operative procedure indicated when the necessary excision of the ossistructure has been made.

Where the mesial root is inclined distally and the distal root is straight, a change in the exolever movements is necessary, as these movements should be executed in conformity with the root formation.

Any attempt to direct the tooth as far distally as in the case where both roots are inclined distally may result in a fracture of the distal root, and the extent to which the excision of the ossistructure on the distal surface may be made is not so great, in the majority of cases, as is indicated in the case where both roots are inclined distally. In order to avoid a fracture of the distal root in such a case, the tooth is directed distally on the initial application of the exolever only far enough to overcome the distal inclination of the mesial root, and the final exolever movement is executed by an application of the exolever to the buccal surface at the bifurcation, using the superior border of the ossistructure at the buccal surface as a fulcrum.

For the initial extraction movement, exolever No. 1L or No. 1R (Fig. 333, page 283) is selected. The gum tissue on the mesiobuccal surface is displaced with the back of the blade, and the blade is directed into the interproximal space between the second and third molars. The flat side of the blade is adjusted to the mesial surface of the third molar and the rounded side engages the superior border of the ossistructure. The blade is inserted as far as possible into the interproximal space between the mesial surface and the ossistructure, with considerable pressure, this causing the blade to act as a wedge, and in many instances the effect will be sufficient to loosen the tooth. If the tooth is not loosened by this procedure, the handle of the exolever is turned mesially, thus directing the tooth distally to overcome the distal inclination of the mesial root, and at the same time raising the tooth out of its socket distally and upward to a point where an adjustment of the exolever can be made to the buccal surface at the bifurcation of the roots. The exolever movement applied to the mesial surface to direct the tooth distally should not be made too far, as a fracture of the straight distal root will result. When the tooth has been loosened by the technic indicated, the exolever employed can be adjusted with the flat side to the buccal surface and the point of the blade directed toward the bifurcation, and, with pressure applied between the buccal surface and the ossistructure on this surface, the wedge thus created will force the tooth out of its socket.

When the tooth is directed with the exolever out of its socket distally far enough to overcome the distal curvature of the mesial root, but is not sufficiently loosened to be extracted by the technic described above, the operator releases the exolever he has been using and selects an exolever for a buccal application, when the technic for such application is followed.

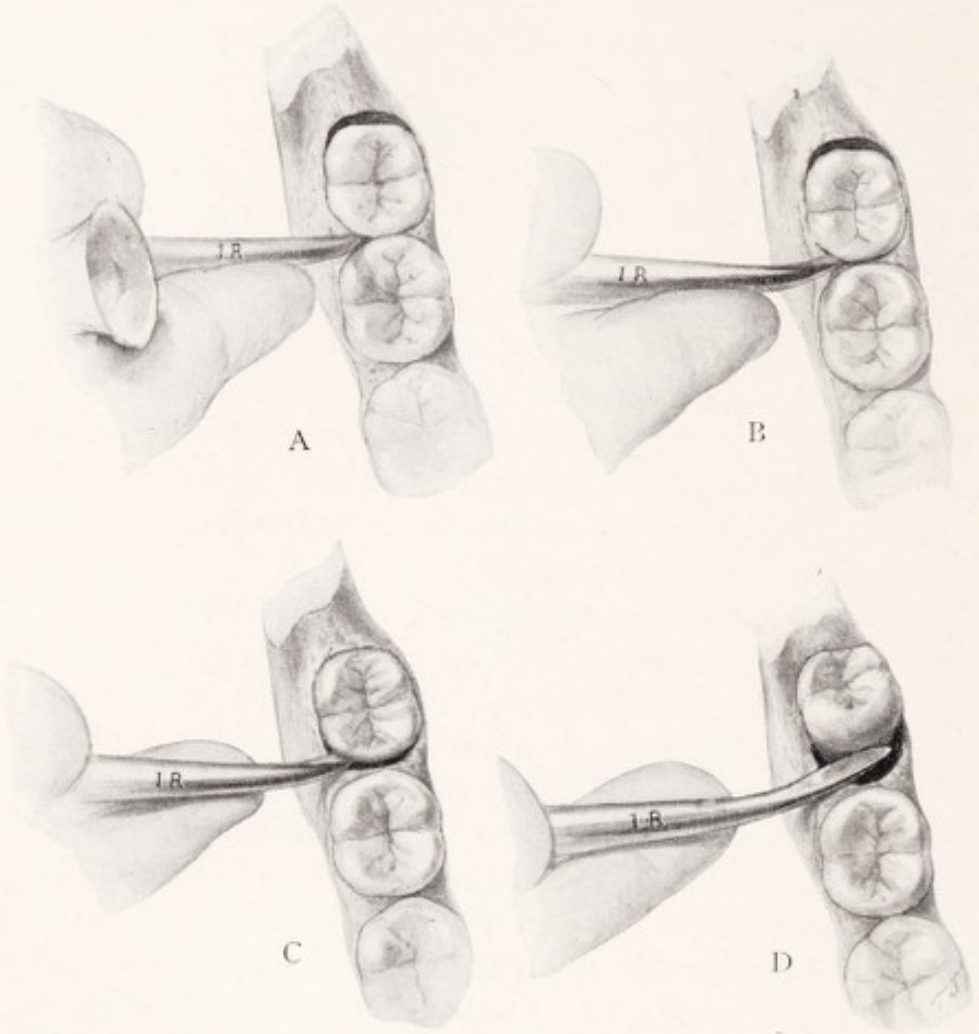


Fig. 381. — Mesial Application of Exolever—Vertical Impaction—No Deflection. *A*, blade of exolever No. 1R applied to mesial surface of third molar; *B*, blade wedged between mesial surface and superior border of ossistructure; *C*, blade wedged farther between mesial surface and ossistructure, handle being directed to a slight extent mesially, and tooth being directed distally and upward, ossistructure being used as a fulcrum; *D*, tooth directed upward and distally out of its socket to a distance where a buccal application can be made to complete extraction.

In Fig. 381 A is shown the blade of exolever No. 1R applied to the mesial surface of the third molar; in Fig. 381 B is shown the blade wedged between the mesial surface and the superior border of the ossistructure; in Fig. 381 C is shown the blade wedged farther between the mesial surface and the ossistructure, the handle of the exolever being directed to a slight extent mesially, and the tooth directed partially distally and upward out of its socket; in Fig. 381 D is shown the tooth directed out of its socket to a distance where a buccal application can

be made to complete the extraction. Where the mesial surface of the third molar is at the gingival third of the second, or in that type of case where the mesial root is in contact with the distal root of the second molar, no attempt should be made to direct the tooth upward and distally with the technic outlined above. Exolever No. 9L for the left side or No. 9R for the right side is therefore used, and, as the blade of the instrument is adjusted to the mesiobuccal surface, the exolever technic is executed as described for a mesiobuccal application (page 368). When the third molar has been directed distally and upward far enough to overcome the curvature of the mesial root, the exolever

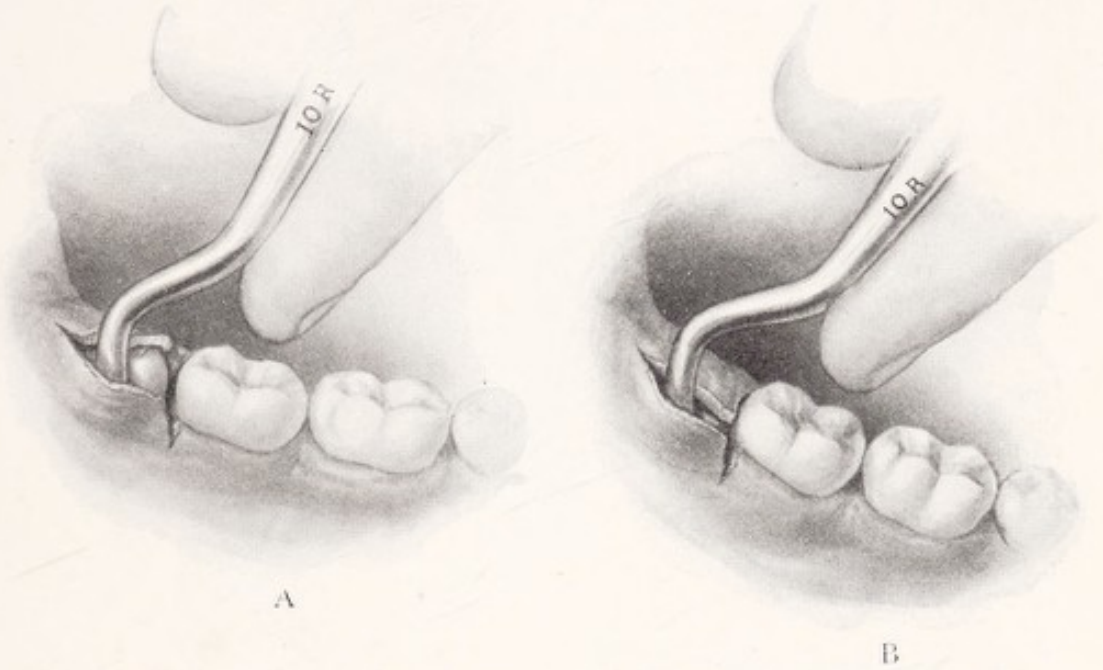


Fig. 382. — Displacing Gum Tissue with Exolever Blade—Buccal Application—Vertical Impaction. *A*, application of blade of exolever No. 10R to displace gum tissue on buccal surface after tooth has been partially directed upward and distally; *B*, gum tissue displaced in location of bifurcation where a buccal application is made independent of a mesial application, and where gum tissue extends over entire tooth.

technic for a buccal application is applied, provided the bifurcation has been raised to a point where the ossistructure will not interfere with the application of the instrument.

Buccal Application.—An application of the exolever to the buccal surface at the bifurcation is made where the root formation indicates such a procedure, provided that the tooth is not separated from its attachment to such a degree as to obviate a change of instrument, and also that the tooth has been partially loosened by the application of the exolever to the mesial or mesiobuccal surface to avoid a fracture of the straight distal root. It was found practicable to use exolever No. 10L for the left side or No. 10R for the right side for this purpose (Fig. 342, page 294). The back of the blade is used to displace the gum tissue in the location where the exolever blade is to be applied

(Fig. 382). The point of the blade, which should be sharp, is directed into the bifurcation on the buccal surface on the right or left side of the arch (Figs. 383, 384), as may be the case, the flat side of the exolever engaging the buccal surface of the crown of the third molar. The exolever is sent down with pressure, depending on the strength of the attachment, on the buccal surface of the third molar as far as the ossistructure on this surface will permit.

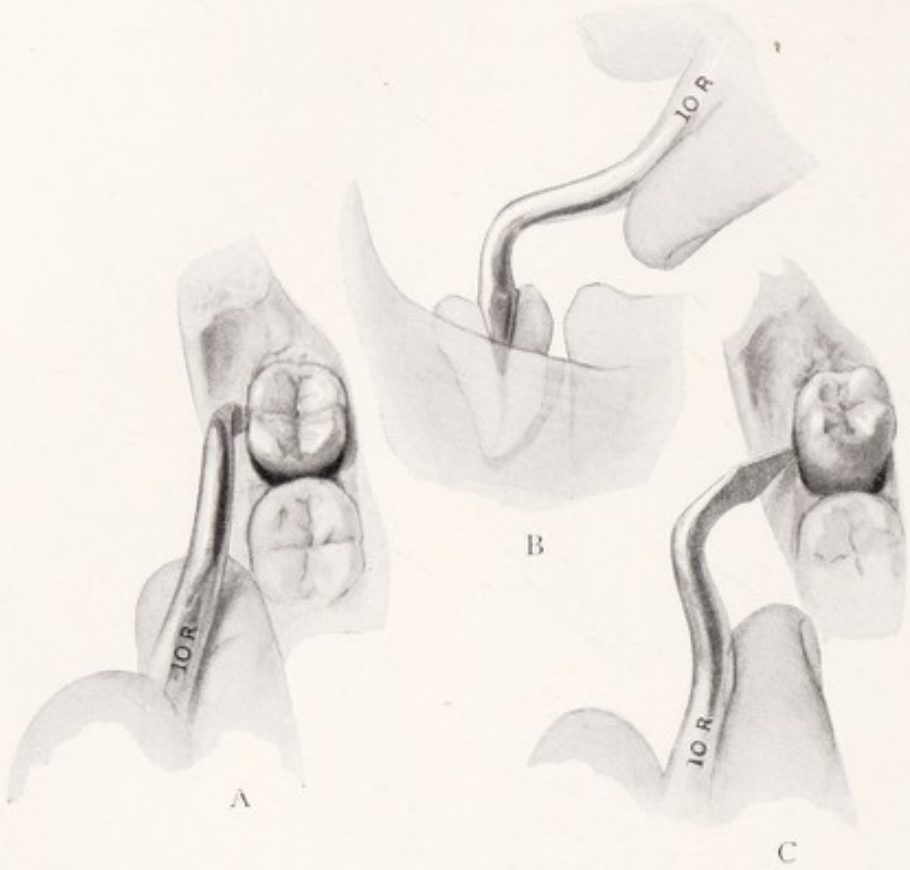


Fig. 383. — Buccal Application of Exolever—Vertical Impaction—No Deflection—Mesial Surface Accessible. *A*, exolever No. 10R applied on right side where tooth has been partially directed distally and upward by application of exolever to mesial surface; *B*, buccal view of exolever blade directed downward on buccal surface in alignment with bifurcation; *C*, point of blade directed toward bifurcation after tooth has been directed distally and upward.

The ossistructure on the buccal surface of the third molar will be an ideal fulcrum, except in an occasional case where it is destroyed at this point by pathologic involvement. Where a secure fulcrum is obtainable, a downward pressure is exerted with the exolever, the point of the blade being directed into the bifurcation, which movement will usually cause the blade to act as a wedge between the buccal surface and the ossistructure on this surface to such an extent as to extract the tooth. If during this procedure resistance is presented, the pressure is increased and the handle of the exolever is turned to a slight extent buccally and downward, which movement will cause the point of the blade more securely to engage the tooth at the bifurcation. The back

of the blade will rest on the ossistructure at the buccal surface, which is then utilized as a fulcrum. Pressing the handle downward will usually extract the tooth, and, where further resistance is presented, repeated exolever movements with increased pressure are made, at the same time sending the blade farther down on the buccal surface, which movement will extract the tooth. This technic will be the means of minimizing the possibility of a fracture of the distal root, and is especially valuable where the occlusal surface of the third molar is quite a distance from the corresponding surface of the second molar.

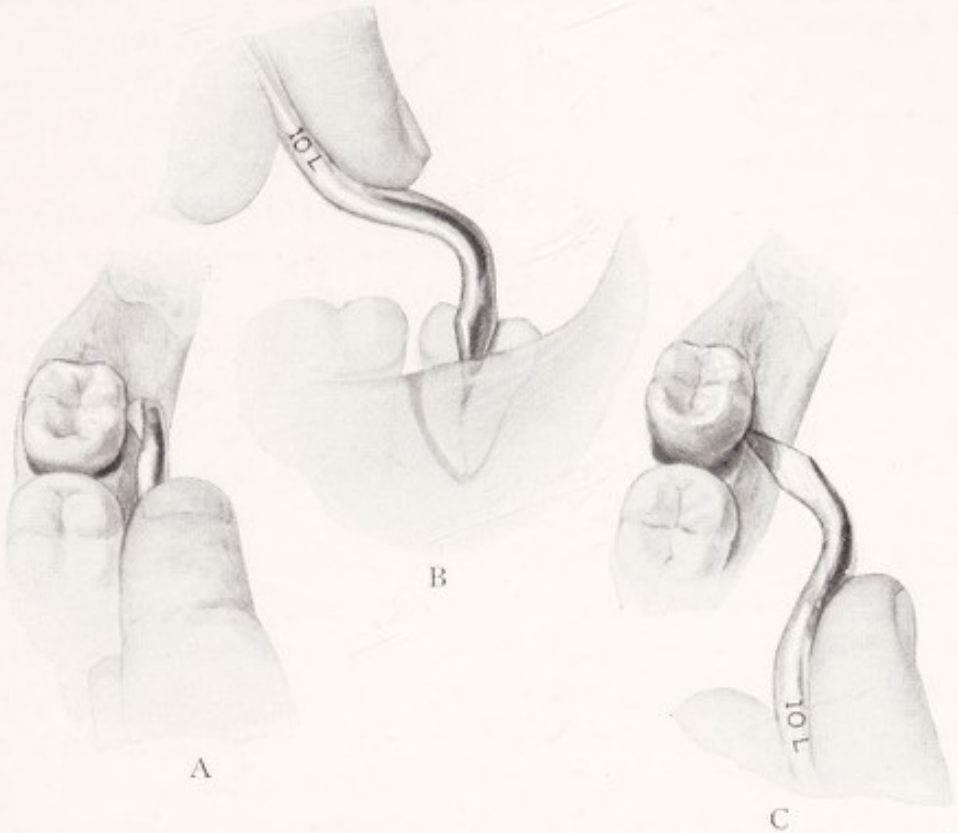


Fig. 384. — Buccal Application of Exolever—Vertical Impaction—No Deflection—Mesial Surface Accessible. *A*, exolever No. 101. applied on left side where tooth has been partially directed distally and upward by application of exolever to mesial surface; *B*, buccal view of exolever blade directed downward on buccal surface in alignment with bifurcation; *C*, point of blade directed toward bifurcation after tooth has been directed distally and upward.

The operator should become proficient in making a buccal application with the exolever, as such an application is frequently made for the extraction of other types of impaction than the one under consideration. The author, some years ago, when making a study of the principles of the lever and fulcrum (pages 321, 323), found that he could utilize the ossistructure on the buccal surface as a fulcrum, and the result has been to eliminate entirely the forceps in the extraction of the third molar.

Where the occlusal surface of the third molar is in alignment with or below the superior border of the ossistructure, and the bifurcation

is quite a distance from the superior border, an attempt to make a buccal application of the exolever without proper excision of the ossistructure will be a failure. A study of the radiogram is made to determine the location of the superior border of the ossistructure and its relation to the bifurcation, and to ascertain to what extent the buccal surface is free of ossistructure, so that the exolever can be properly applied to the buccal surface, or to what extent excision of the ossistructure, if indicated, is to be made in advance of the application of the exolever to the buccal surface.

Mesial Root Inclined Distally and Distal Root Inclined Mesially—Mesial Application.—Where the third molar is in a vertical position, with the mesial root inclined distally and the distal root inclined mesially, and where the roots are not fused into a solid mass, having a septum between them that will vary in size, there will be a tendency to increase the resistance during the execution of the exolever movements. The resistance of the septum is the important factor to be considered in the extraction of a third molar in this type of impaction.

The application of sufficient pressure to the mesial surface when the tooth is being directed distally with the exolever will fracture the septum, and by this procedure the operator will avoid a fracture of the crown, roots or part of the lingual plate. A fracture of the lingual plate is usually associated with the extraction in this type of case when the forceps technic is attempted. It has always been difficult to overcome the resistance of the septum with forceps, as it cannot be fractured without the use of considerable force, and consequent injury to the lingual plate, with the movements that can be applied with that instrument. Considerable resistance will be presented during the extraction movements, and when the tooth is extracted with forceps, a large part of the lingual plate will be attached, leaving the socket jagged on the lingual side, and this will be difficult to dress down with rongeur forceps or any other instrument. It was found that the difficulty of extraction is minimized by an exolever technic, and that, as the roots are located in the cancellous ossistructure and a lingual or buccal movement of the tooth with any kind of instrument is not practicable, a distal movement will produce a clean fracture of the septum between the roots. This procedure will leave intact the ossistructure on the buccal and lingual sides of the socket, and will not affect the lingual plate.

The formation of the roots and the resistance of the septum, when the latter is present, indicate that the initial movements with the exolever should be made deliberately and without hesitation on the part of the operator in order to attain the desired results, as the object is to produce a clean fracture of the septum between the roots if the tooth

is free of ossistructure on the distal surface down to the gingival third owing to a pathologic condition, or when the ossistructure has been excised to allow the tooth to be directed distally far enough to overcome the resistance of the septum. The size of the interproximal space between the second and third molars will determine the size of the exolever blade to be used, and exolever No. 1L, 1R; No. 2L, 2R; or No. 3L, 3R is indicated. The gum tissue on the mesiobuccal surface is displaced with the back of the blade, and the blade is directed into the interproximal space between the second and third molars. The flat side of the blade is adjusted to the mesial surface of the third molar and the rounded side engages the distal surface of the second molar. The initial extraction movement is made by using the blade as a wedge, this having the effect of directing the tooth distally to a slight extent. Sufficient pressure is then applied to direct the tooth farther distally by turning the handle of the exolever mesially to produce a clean fracture of the septum between the roots.

A vacillating movement with the exolever will fail to loosen the tooth, as the movement, to be effective, should be made deliberately and under full control. Tentative movements and repeated applications with the exolever will have a tendency to mar the distal surface of the second molar and cause only a partial fracture of the septum between the roots, so that resistance will be presented when the exolever is applied to the buccal surface for the final extraction movements.

Where the mesial surface of the third molar is at the gingival third of the second molar, or in that type of case where the mesial root is in contact with the distal root of the second molar, no attempt should be made to apply the exolever to the mesial surface, with the second molar used as a fulcrum. Exolever No. 9L or 9R is therefore selected, and, in addition, as the blade of the instrument is adjusted to the mesiobuccal surface the same exolever movements described above are made, and, as soon as the tooth has been raised to a point where the distal surface of the second molar can be utilized as a fulcrum, exolever No. 2L, 3L or No. 2R, 3R can be applied more effectively to fracture the septum between the roots and execute the exolever movements.

Buccal Application.—As soon as the tooth has been directed distally to a point that will fracture the septum between the roots, the exolever employed, or exolever No. 10L or 10R is adjusted to the buccal surface, and the exolever technic described for a buccal application (page 361) is executed.

Both Roots Straight—Mesial Application.—Where the third molar is in a vertical position, with the mesial surface above the gingival third of the second molar and an approximately normal interproximal space and an approximately normal interseptum between the second

and third molars, both roots being straight, the exolever technic is the operative procedure indicated for the extraction of the tooth after the necessary excision of the ossistructure has been made. Clinical and radiographic examinations should be made of the size and shape of the crown and the interproximal space. An attempt to direct the tooth distally as in the case where both roots are inclined distally, or where the mesial root is inclined distally and the distal root is straight, will result either in a fracture of the crown or the mesial or distal root, or of both roots. The tooth is directed distally only to a slight extent to overcome the resistance of the peridental membrane and to loosen the tooth. Fortunately this type of root formation does not occur frequently, as it is not so favorable for an exolever technic as the other types of root formation.

Where the buccal and lingual surfaces are free of ossistructure, the operator not accustomed to the exolever technic can, while familiarizing himself with the use of the exolever, employ the forceps until he becomes proficient in the exolever technic, as this is one of the types where the forceps technic can be executed. When the necessary excision of the ossistructure has been made, the interproximal space between the second and third molars will determine the size of the exolever to be used, and exolever No. 1L, 1R; No. 2L, 2R; or No. 3L, 3R is selected. The gum tissue over the mesiobuccal surface is displaced with the back of the blade, and the blade is directed into the interproximal space between the second and third molars, the flat side of the blade being applied to the mesial surface of the third molar and the rounded side engaging the distal surface of the second molar. The blade, when inserted into the interproximal space, acts as a wedge and will usually loosen the tooth if it is not firmly attached. If the tooth is not loosened by this procedure, the handle of the exolever is turned to a slight extent mesially in order to break up the attachment of the peridental membrane and loosen the tooth; but no forcible movement should be made distally, as such a movement will have a tendency to cause a fracture. As soon as the tooth has been slightly loosened by this procedure, the exolever employed is released and an exolever for a buccal application is selected. It is not unusual to find a marked divergency of the roots, and, when present, also a bifurcation of the mesial or distal root, which condition will have a tendency to increase the resistance.

Buccal Application.—As soon as the tooth has been slightly loosened by the application of the exolever to the mesial surface, the operator should satisfy himself that there is sufficient buccal surface free of ossistructure to apply the exolever as described for a buccal application (page 361).

Where the operator is proficient in the use of the exolever, he can in many cases eliminate the technic of a mesial application, executing a complete exolever movement by an application of the exolever to the buccal surface at the bifurcation, and can also eliminate a distal excision where the ossistructure does not extend over the distoclusal surface.

Where a buccal application is made independent of a mesial application, the blade is directed with considerable pressure between the buccal surface and the ossistructure on this surface, the blade acting as a wedge to assist in directing the tooth upward out of its socket in line with its long axis.

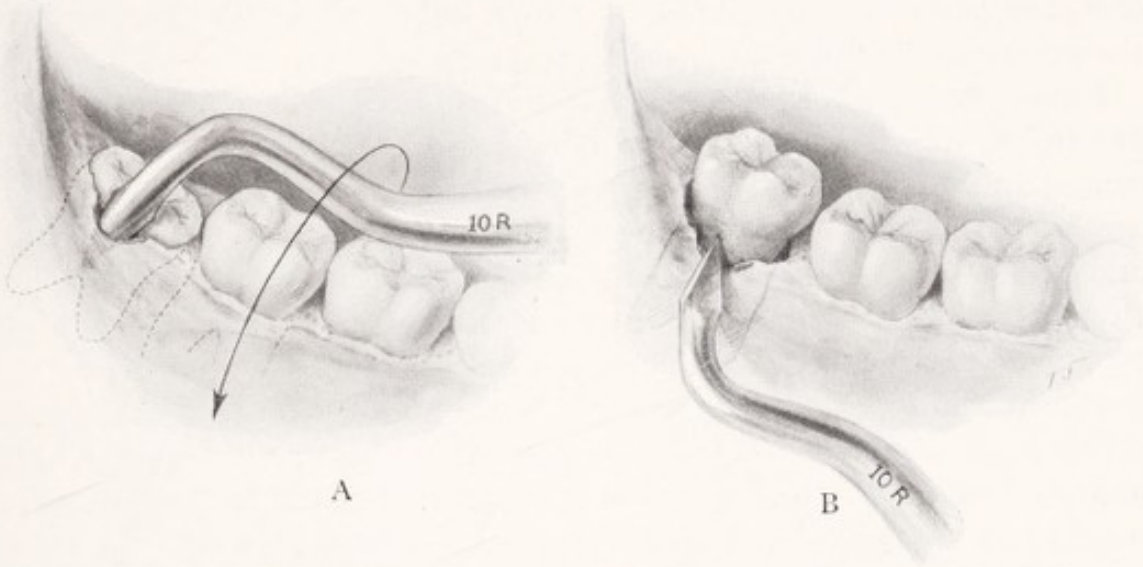


Fig. 385. — Buccal Application of Exolever—Vertical Impaction—No Deflection. *A*, buccal application with exolever No. 10R, viewed from buccal, where an excision has been made in line with bifurcation and blade is wedged between ossistructure and buccal surface; *B*, tooth directed upward out of its socket by turning handle buccally.

In Fig. 385 A is shown exolever No. 10R applied to the buccal surface in alignment with the bifurcation, where a previous excision has been made to permit the application of the blade of the exolever; in Fig. 385 B is shown the handle turned buccally to direct the tooth upward out of its socket.

Where the roots are bifurcated or are extremely long, repeated applications of the exolever may be necessary, and each successive application should be made with an effort to increase the effectiveness of the wedge, so that the blade may be directed farther between the bifurcation. If it is observed that the fulcrum is lost with the size of exolever blade employed, exolever No. 12L, 12R or No. 13L, 13R, with a larger blade, is used and the application is repeated, the pressure being increased until the tooth is extracted. In the majority of cases a tooth in this condition can be extracted without a fracture of either root.

Mesial Root Straight and Distal Root Inclined Mesially—Mesial and Buccal Applications.—A case where the third molar is in a vertical position, with the mesial root straight and the distal root inclined mesially, is not frequently seen in practice. The exolever technic is the same as described above in a case where both roots are straight, but there will be a liability of a fracture of the distal root, and the operator should be prepared for the extraction of the root if such a fracture occurs.

Both Roots Divergent—Mesial and Buccal Applications.—Where the third molar is in a vertical position, with both roots divergent, the exolever technic is the same as described above in a case where both roots are straight. The probability of a fracture of one or both roots will, however, always confront the operator and he should be prepared for the extraction of the roots if such a fracture occurs.

Fused Roots—Mesial and Buccal Applications.—Where the roots are fused, the resistance will not be so great as where they are separated and there is a septum between them. The exolever movements are executed, as in a case where the mesial root is inclined distally and the distal root is straight, by making a mesial and buccal application with the exolever, or, as in a case where both roots are straight, by depending entirely on a buccal application.

In Fig. 386 A is shown exolever No. 10R applied to the buccal surface on the right side, viewed from the lingual in alignment with the bifurcation of the roots; in Fig. 386 B is shown the tooth partially directed upward by the pressure applied downward to the handle and the wedge created by the blade between the ossistructure on the buccal surface and the tooth, and in Fig. 386 C is shown the blade directed farther downward and the tooth directed upward out of its socket.

Mesiobuccal Application.—Where there is a contact of the mesial surface of the mesial root of the third molar with the distal surface of the distal root of the second molar, the adjustment of the exolever between the second and third molars should not be attempted, as it will force one root against the other, and will have a tendency to loosen or dislodge the second molar, an incident that should be avoided.

Where the condition described above prevails, exolever No. 9L for the left side or No. 9R for the right side is indicated (Fig. 341, page 292). The gum tissue on the mesiobuccal surface is displaced with the back of the blade of the exolever, and the blade is directed downward with considerable pressure in alignment with this surface. Where the roots are short the wedge created is usually sufficient to dislodge the tooth. Where the roots are large considerable resistance will be encountered and the sharp point of the blade penetrates the ossistructure to a distance where a secure fulcrum

can be obtained, when the handle of the exolever is directed to a slight extent mesially or distally, which procedure is repeated as may be necessary, the blade each time being sent farther down to create a wedge to loosen the tooth. The application of the exolever to the mesiobuccal surface will obviate the use of the second

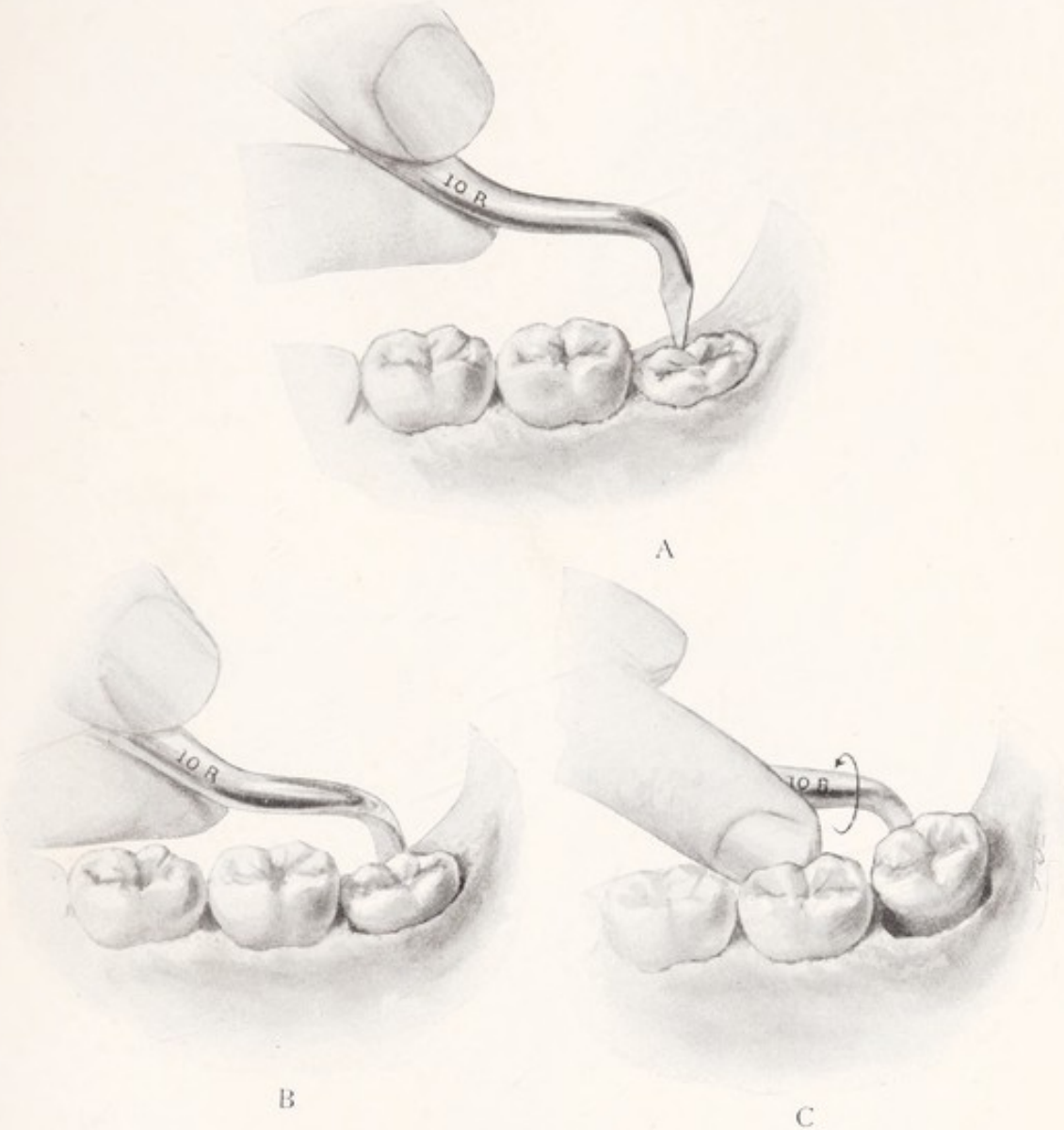


Fig. 386. — Buccal Application of Exolever—Vertical Impaction—No Deflection. *A*, application of exolever No. 10R to buccal surface of third molar in line with bifurcation, viewed from lingual; *B*, blade directed downward and wedged between buccal surface and ossistructure on this surface, and tooth directed partially upward; *C*, blade directed farther downward, and tooth directed upward out of its socket.

molar as a fulcrum, dependence being placed on the ossistructure anterior to this surface, which is not so efficient as the second molar, but will serve the purpose.

Usually a part of the crown of the third molar is exposed where there is a space between the mesiobuccal surface and the distobuccal surface of the second molar, and the blade of exolever No.

9R or 9L is used to displace the gum tissue over the mesiobuccal surface after the necessary incision has been made (Fig. 387 A). Where the mesial surface is in close contact with the distal surface, the application of the exolever should be made cautiously when displacing the gum tissue, so that the blade does not come in contact with the distobuccal surface of the second molar (Fig. 387 B).

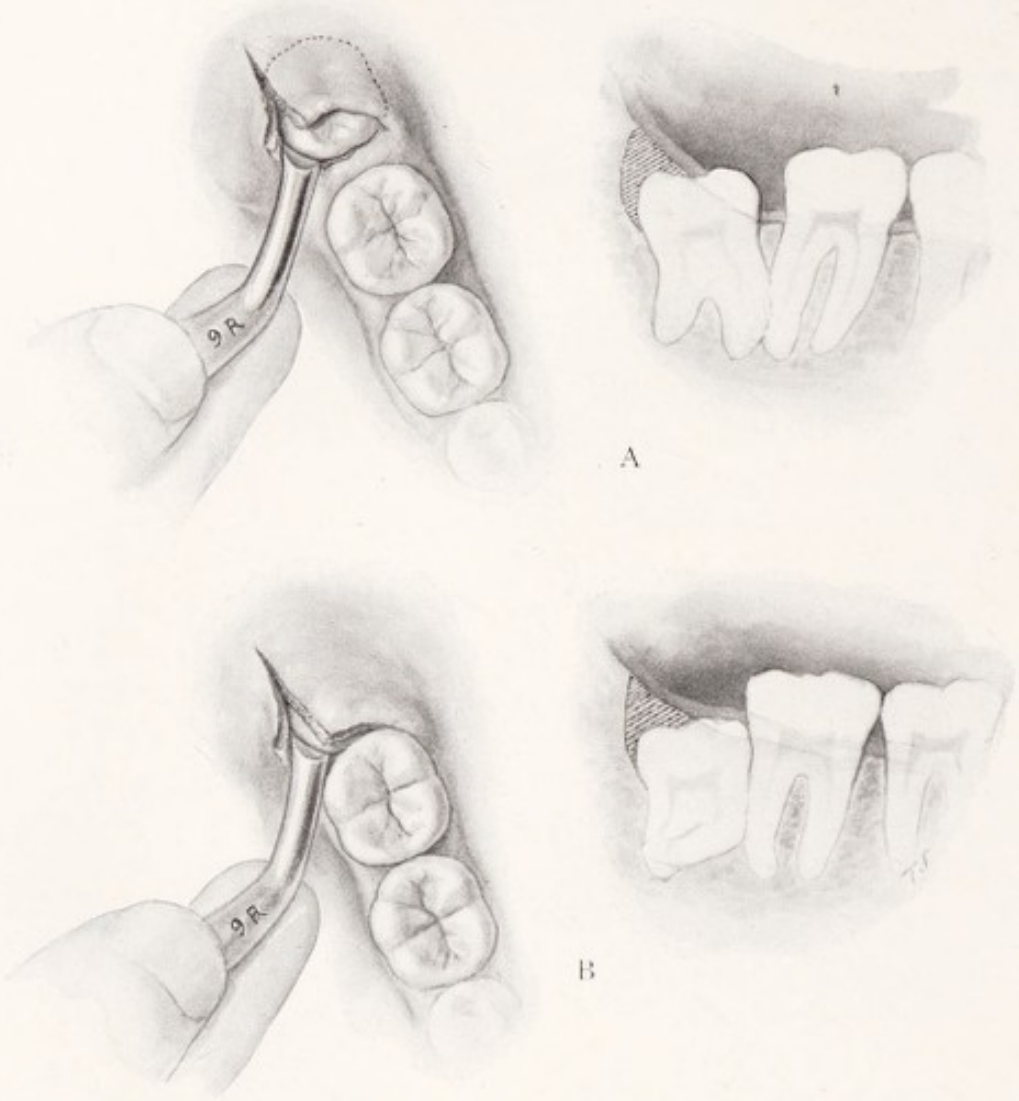


Fig. 387. — Displacing Gum Tissue over Mesiobuccal Surface with Exolever Blade—Mesiobuccal Application—Vertical Impaction—No Deflection. *A*, exolever No. 9R displacing gum tissue over mesiobuccal surface, where tooth is partially covered by gum tissue and there is quite a space between mesiobuccal surface of third molar and distobuccal surface of second, and where there is a contact of the roots; *B*, application of same exolever to mesiobuccal surface, where gum tissue extends over entire crown and mesial surface of third molar is in contact with distal surface of second, and where there is a contact of roots.

In Fig. 388 A is shown exolever No. 9R applied to the mesiobuccal surface on the right side, viewed posteriorly; in Fig. 388 B is shown the exolever directed downward in alignment with the mesiobuccal surface by applying pressure on the handle, creating a wedge between the mesiobuccal surface and the ossistructure and directing the tooth partially upward, and this movement, when the roots are

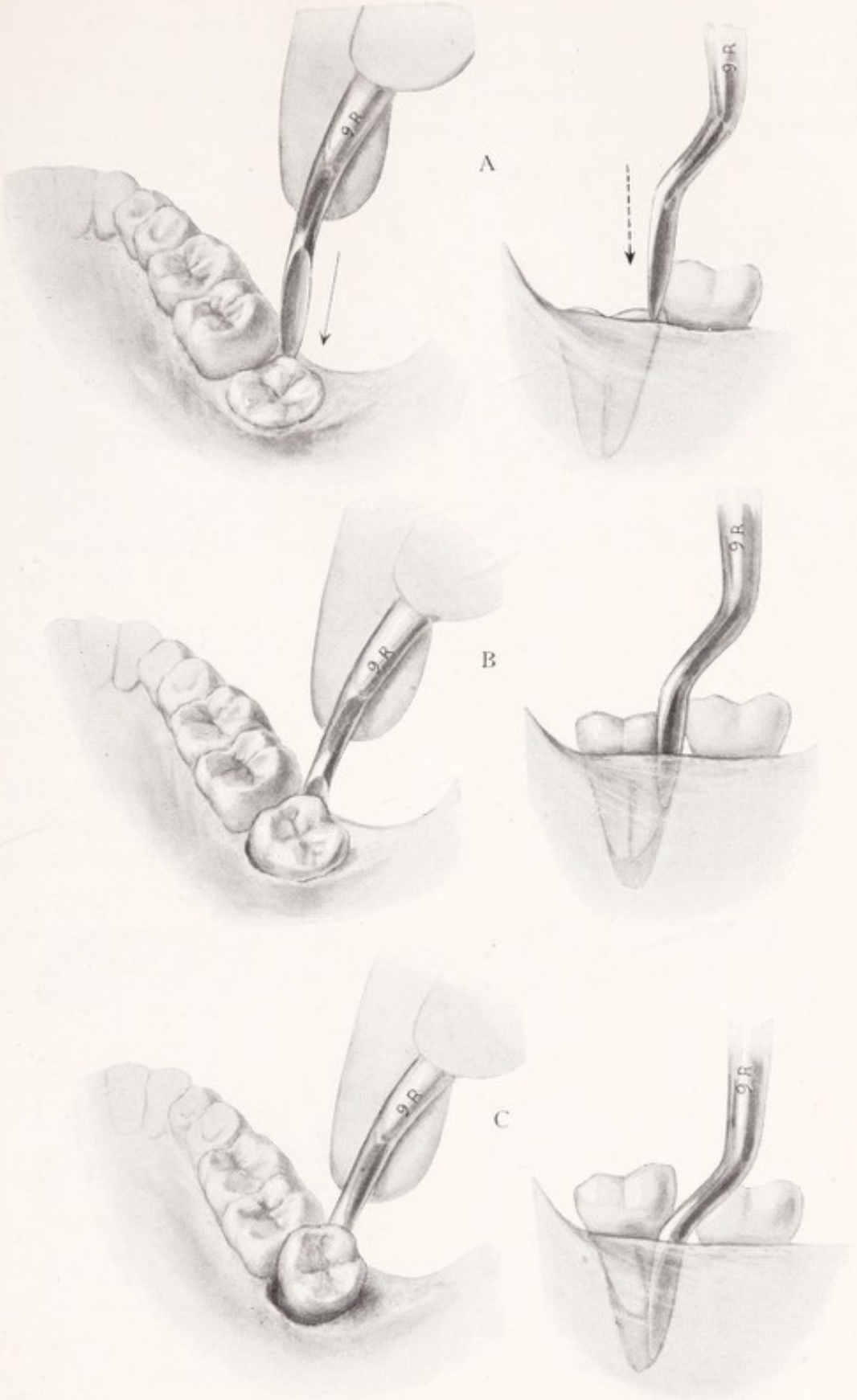


Fig. 388. — Mesiobuccal Application of Exolever—Vertical Impaction—No Deflection. *A*, exolever No. 9R being applied to mesiobuccal surface of third molar, viewed posteriorly; *B*, blade directed downward in alignment with mesiobuccal surface and wedged between this surface and ossistructure, and tooth directed partially upward; *C*, blade directed farther downward and tooth directed upward out of socket.

short, is often sufficient to extract the tooth; in Fig. 388 C is shown the blade of the exolever directed farther down on the mesiobuccal surface and the tooth directed upward out of its socket. The latter procedure is followed where resistance is encountered.

SUMMARY OF CASES

The thousands of radiograms made of cases of the impacted mandibular third molar from which definite technics were developed were also used in the classification for describing conveniently each technic, and were arranged according to the position of the tooth, its root formation, the character of the supporting ossistructure and the relation of the third molar to the second.

Summarizing the radiographic interpretation and the operative technic indicated for each type of case, the plan was developed to have the operator, when he has a certain type of case, compare the radiogram of his case with the radiogram of a similar case shown in this book, and this plan should be followed for each type of impaction.

In the cases shown in Fig. 389 the occlusal surface of the third molar is in alignment with or slightly below the corresponding surface of the second and both roots are inclined distally. A pathologic condition has involved the ossistructure on the distal surface of the third molar, but not to such an extent that the exolever technic can be executed without excision on the distal surface to permit the tooth to be directed distally by the application of the exolever to the mesial surface in conformity with the root formation.

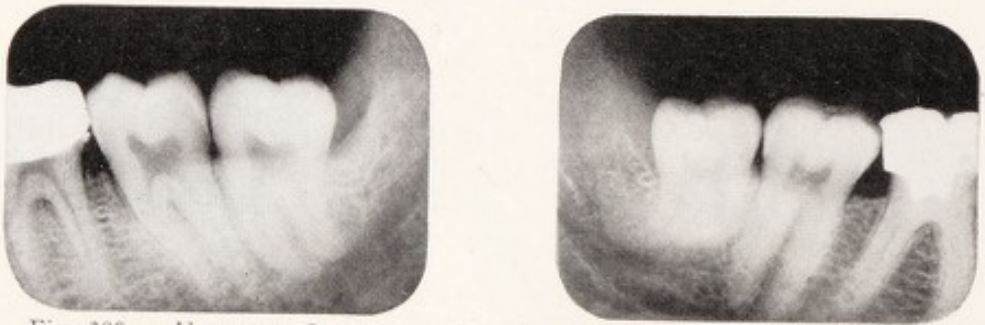


Fig. 389. — Vertical Impaction—No Deflection—Mesial Surface Accessible. Both roots are inclined distally with an extensive pathologic condition on distal surface and greater part of buccal and lingual surfaces free of ossistructure.

In the cases shown in Fig. 390 the condition is similar to that shown in Fig. 389, except that the pathologic condition has not so extensively involved the ossistructure on the distal surface, and greater excision on this surface is indicated in advance of applying the exolever to the mesial surface.

In the case shown in Fig. 391 A the condition is similar to that shown in Figs. 389 and 390, except that the occlusal surface of the third molar is some distance from the corresponding surface of the

second, and the interproximal space between these two teeth is smaller, access for the application of the ossisector and exolever not being so readily obtained. The ossistructure extends over the entire distal surface of the third molar, and is involved only slightly by pathologic changes. In this case excision on the distal surface will be difficult on account of the distance for access. The application of the exolever between the second and third molars should not be attempted and a mesiobuccal application is initially indicated.

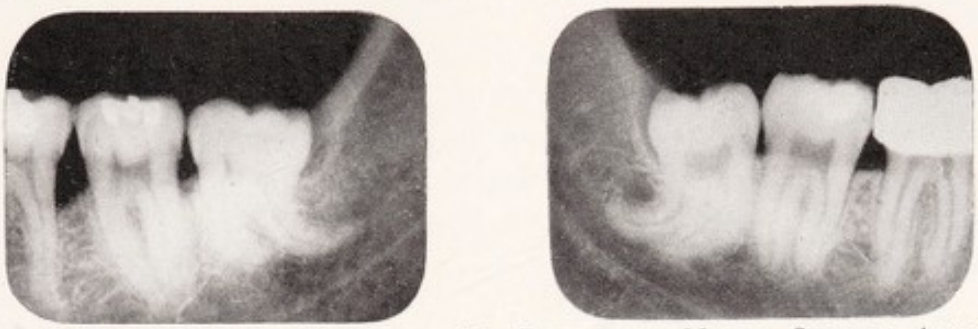
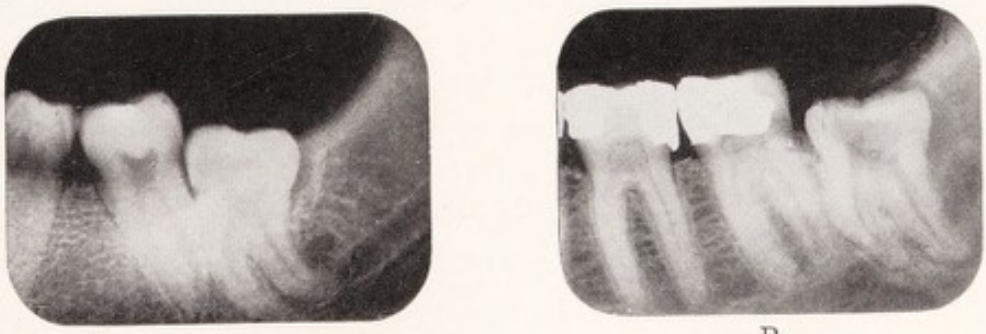


Fig. 390. — Vertical Impaction—No Deflection—Mesial Surface Accessible. Both roots inclined distally, with a slight pathologic condition on distal surface and part of lingual and buccal surfaces free of ossistructure.

In these cases, in order to avoid extensive excision on the distal surface, a buccal application, as described on page 361, can be made to complete the extraction, provided sufficient excision has been made on the distal surface to permit the tooth to be directed distally and upward to a point where a buccal application can be made.

In the case shown in Fig. 391 B both roots are inclined distally. The ossistructure extends over the distoclusal surface and on the entire distal surface, and the ossistructure over the occlusal surface is excised in advance of that on the distal surface. The ossistructure extends also on the greater part of the buccal surface, and, where the roots are of an extreme length, extensive excision is indicated on the distal surface, but can be decreased to some extent by an excision of the ossistructure on the buccal surface distal to the bifurcation to allow a buccal application of the exolever.



A B

Fig. 391. — Vertical Impaction—No Deflection—Mesial Surface Accessible. *A*, both roots inclined distally, with mesial surface at gingival third of second molar. The ossistructure extends over entire distal surface and greater part of lingual and buccal surfaces; *B*, both roots inclined distally. The ossistructure extends over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

The mesial root of the third molar is in close contact with the distal root of the second, and the initial application of the exolever is made to the mesiobuccal surface, but the second molar should not be used as a fulcrum.

In Fig. 392 A is shown a radiogram of a third molar where both roots are inclined distally. The roots have the appearance of being entirely separated and not coming together at their apical third.

In Fig. 392 B is shown the extracted tooth, which should be compared with the radiogram, and it will be observed that the mesial root is fused with the distal root, a condition that cannot always be determined from the radiogram. This condition increases the resistance of the septum between the roots, which in this case will not be so readily fractured as where the roots are separated. The case is a good example to illustrate the condition when a forceps technic executed in line with the long axis of the tooth will result in a fracture, and where an exolever technic, by applying the instrument to the mesial surface after sufficient excision of the ossistructure on the distal surface has been made, can be executed in conformity with the root formation and cause a clean fracture of the septum between the roots.

A B

Fig. 392. — Vertical Impaction—No Deflection—Mesial Surface Accessible. *A*, both roots inclined distally and appear separated; *B*, extracted tooth, with mesial root fused to distal root.

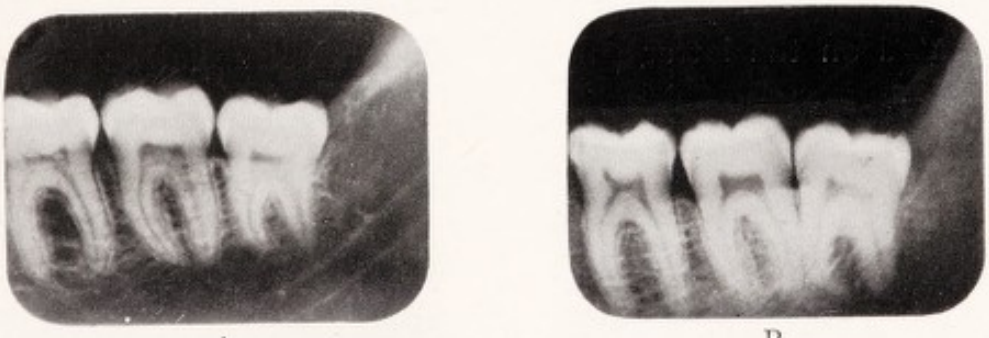
In the cases shown in Fig. 393, where the mesial root is inclined distally and the distal root is straight, the mesial surface of the third molar is above the gingival third of the second, and the occlusal surface of the third molar is slightly below the corresponding surface of the second, with an approximately normal interproximal space. In the case shown in Fig. 393 A a pathologic condition involves the ossistructure on the distal surface of the third molar to such an extent that no excision is indicated on this surface, and the application of the exolever to the mesial surface can be made without interference of the ossistructure on the distal surface. In the case shown in Fig. 393 B a slight excision is indicated on the distal surface. The application of the exolever to the mesial surface

and the exolever movements are the same as described for this type of root formation where the mesial root is inclined distally and the distal root is straight (page 358), the extraction being completed by a buccal application.

A B

Fig. 393. — Vertical Impaction—No Deflection—Mesial Surface Accessible. *A*, mesial root inclined distally and distal root straight, with extensive pathologic condition on distal surface and greater part of lingual and buccal surfaces free of ossistructure; B, same root formation but pathologic condition is not so extensive on distal surface.

In the cases shown in Fig. 394 the condition is similar to that shown in Fig. 393, except that the ossistructure is not so extensively involved by pathologic changes and excision on the distal surface is indicated. In the case shown in Fig. 394 A, after the necessary excision has been made on the distal surface, the exolever is applied to the mesial surface to direct the tooth upward and distally to a point where a buccal application can be made to complete the extraction. In the case shown in Fig. 394 B, on account of the contact of the roots, the application of the exolever should be made to the mesiobuccal surface and not to the mesial surface in order to direct the tooth upward and distally to a point where a buccal application can be made to complete the extraction.



A B

Fig. 394. — Vertical Impaction — No Deflection — Mesial Surface Accessible. *A*, mesial root inclined distally and distal root straight. The ossistructure on distal surface extends up to occlusal surface, which is slightly involved by a pathologic condition, and over greater part of lingual and buccal surfaces. There is no contact of roots; *B*, roots in contact.

In the cases shown in Fig. 395 the condition is similar to that shown in Figs. 393 and 394, except that the ossistructure on the distal surface is not involved by pathologic changes and it will not

be so readily excised. Excision is made on the distal surface from the occlusal surface down to the gingival third. In Fig. 395 A no contact of the roots is shown, and a mesial application of the exolever is indicated; in Fig. 395 B is shown a contact of the roots, and a mesiobuccal application is indicated. In both cases the tooth is directed upward and distally to a point where a buccal application can be made to complete the extraction.

In the case shown in Fig. 396 A a part of the mesial root of the third molar is in contact with the distal root of the second, and there is a pathologic involvement on the distal surface of the third molar. In this case the second molar should not be used as a fulcrum, and the application of the exolever is made on the mesiobuccal surface of the third molar. After the tooth has been directed to a slight extent distally to overcome the distal inclination of the mesial root, a buccal application is made to complete the extraction. No excision of the ossistructure is indicated.

A B

Fig. 395. — Vertical Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight. The ossistructure on distal surface extends up to occlusal surface and over greater part of lingual and buccal surfaces. *A*, no contact of roots; *B*, roots in contact.

In the case shown in Fig. 396 B, where the roots are fused, with a slightly pathologic condition on the distal surface, a slight excision is indicated on the latter surface. The entire mesial surface of the

A B

Fig. 396. — Vertical Impaction—No Deflection—Mesial Surface Accessible. *A*, part of mesial surface of mesial root is in contact with distal surface of distal root of second molar. The ossistructure on distal surface is extensively involved by a pathologic condition and lingual and buccal surfaces are free of ossistructure down to gingival third; *B*, almost entire mesial surface of mesial root is in contact with distal root of second molar. The ossistructure on distal surface is slightly involved by a pathologic condition and part of lingual and buccal surfaces is free of ossistructure.

crown and root is in contact with the distal surface and root of the second molar, indicating a mesiobuccal adjustment of the exolever, and the extraction is completed with this application. Where the ossistructure does not interfere with a buccal adjustment the extraction can also be executed with a buccal application of the exolever independent of a mesiobuccal application.

In the cases shown in Fig. 397 the root formation verges on a fused type, and excision of the ossistructure on the distal surface should not be made to the same extent as where the roots are inclined distally. An exolever with a small blade is employed for the mesial application, and, as there will be very little resistance, the initial application will usually loosen the tooth, the extraction being completed by a buccal application. In the majority of cases of this kind where the operator is skilled in the use of an exolever, the entire operation can be completed with a buccal application and no excision will be indicated on the distal surface (Fig. 386, page 369).

Fig. 397. — Vertical Impaction—No Deflection—Mesial Surface Accessible. Roots fused. The ossistructure extends over entire distal surface, which is slightly involved by a pathologic condition at this point, and greater part of lingual and buccal surfaces.

In the cases shown in Fig. 398, where the mesial root is inclined distally and the distal root is straight, the ossistructure extends over the distoclusal surface, and is excised in advance of any ossistructure on the distal surface. The ossistructure extends on the greater part of the buccal surface, and the application of the exolever to the mesial surface, provided sufficient excision has been

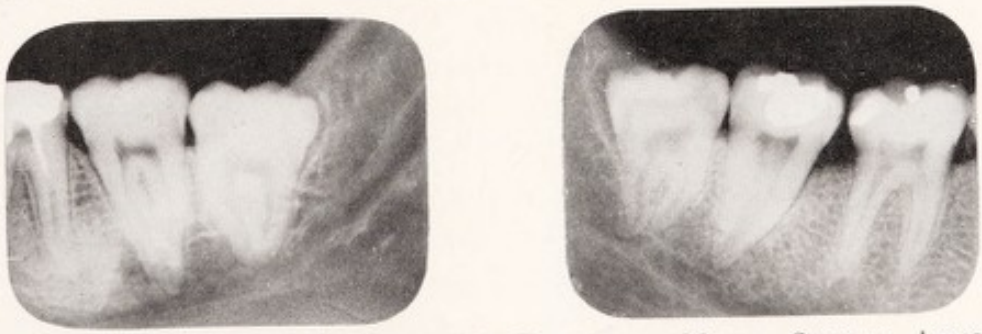


Fig. 398. — Vertical Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight. The ossistructure extends over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

made over the distoclusal surface and on the distal surface, should raise the tooth to a point where a buccal application can be made without excision on the buccal surface.

In the cases shown in Fig. 399 the mesial root is inclined distally and the distal root is straight, with the mesial surface of the third molar above the gingival third of the second. The ossistructure extends over the distoclusal surface, on the entire distal surface and on the greater part of the lingual and buccal surfaces, and the mesial root of the third molar is in contact with the distal root of the second. In such a case an occlusal radiogram should be made in order to determine the exact alignment of the crown, as occasionally the crown may be deflected to a slight extent buccally, and, if there is such a deflection, it will be quite an advantage in the application of the exolever technic. The exolever is applied to that part of the mesial surface of the crown of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second molar, as described in the case of a buccal deflection where the mesial surface is accessible (page 400).

Fig. 399. — Vertical Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with mesial root in contact with distal root of second molar. The ossistructure extends over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

Where the buccal surface of the crown of the third molar is in alignment with the corresponding surface of the second, and the mesial root of the third molar is in contact with the distal root of the second, with a septum between the roots, a great deal of resistance will be presented. In addition to the excision of the ossistructure over the distoclusal surface and on the distal surface, the ossistructure on the buccal surface distal to the bifurcation is excised to allow the application of the exolever to the latter surface. When directing the tooth distally and upward by the application of the exolever to the mesiobuccal surface, using the ossistructure anterior to this surface as a fulcrum, in order to execute an exolever movement in conformity with the distal inclination of the mesial root, the character of the septum between the roots and the position of the straight distal root, the movement should be made with caution, so that the tooth may not be directed too far

distally. If this incident occurs, the mesial root of the third molar will be forced against the distal root of the second, and in such a case, if too much pressure is exerted, the second molar will be loosened or dislodged. The third molar should be loosened only to an extent that will permit it to be extracted by a buccal application. No attempt should be made in this type of case to adjust the exolever to the mesial surface and use the second molar as a fulcrum.

In the case shown in Fig. 400 the mesial root is inclined distally and the distal root is straight, with the ossistructure extending over the distoclusal surface, on the entire distal surface and on the greater part of the lingual and buccal surfaces. The mesial root of the third molar is almost in contact with the distal root of the second, and there is a large space between the second and third molars. In such a case the operator will be tempted, after the excision of the ossistructure, to take advantage of the available space and insert an exolever between the second and third molars, but this course will be disastrous to the second molar on account of the root contact. The proper procedure is to adjust the exolever to the mesiobuccal surface, making the exolever movements independent of the use of the second molar as a fulcrum, and completing the extraction with a buccal application.

Fig. 400. — Vertical Impaction—No Deflection—Mesial Surface Accessible. Part of mesial surface of mesial root in contact with distal root of second molar, with a large space between crowns of second and third molars. The ossistructure extends over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

In the cases shown in Fig. 401, the occlusal surface of the third molar is in alignment with or slightly below the corresponding surface of the

Fig. 401. — Vertical Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially, with extensive pathologic condition on distal surface and greater part of lingual and buccal surfaces free of ossistructure.

second, the mesial root is inclined distally and the distal root is inclined mesially and there is a variation in the character of the septum between the roots. Pathologic changes have involved the ossistructure on the distal surface to such an extent that no excision will be necessary on this surface, and the exolever technic described for this type of root formation (page 364) can be applied without interference. The initial application of the exolever to the mesial surface should, where possible, be final, and sufficient pressure is applied to fracture the septum between the roots in order that the tooth can be directed upward and distally to a point where the extraction can be completed with a buccal application.

In the cases shown in Fig. 402 the condition is similar to that shown in Fig. 401, except that pathologic changes have not so extensively involved the ossistructure on the distal surface, and excision on this surface is indicated before the application of the exolever is made to the mesial surface. The ossistructure has been weakened by the pathologic involvement and the condition will permit ready excision.

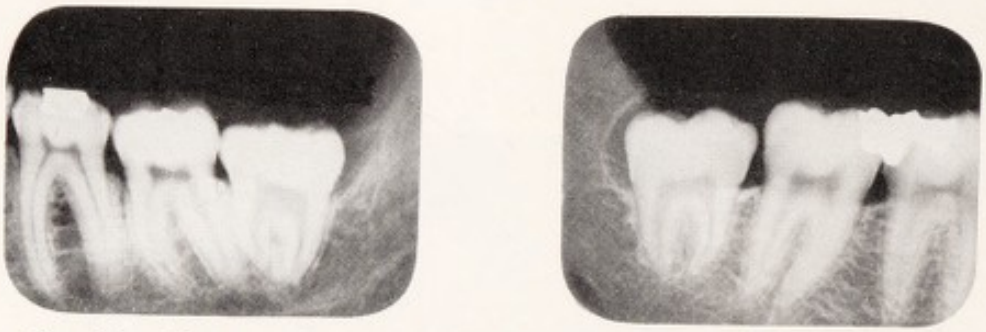


Fig. 402. — Vertical Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially. There is a pathologic condition on distal surface, with a variation in location of ossistructure on lingual and buccal surfaces.

In the cases shown in Fig. 403 the mesial root is inclined distally and the distal root is inclined mesially, with the mesial surface of the third molar slightly above the gingival third of the second, and an exolever with a large blade should not be used for the initial application to the

Fig. 403. — Vertical Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially, with mesial surface slightly above gingival third of second molar. The ossistructure on distal surface extends up to occlusal surface and over part of lingual and buccal surfaces.

mesial surface. There is a variation in the character of the ossistructure on the distal surface and excision is indicated, extraction being completed by a buccal application.

In the cases shown in Fig. 404 the conditions similar to that shown in Fig. 403, except that there is a larger space available for the application of the exolever to the mesial surface, and excision is indicated on the distal surface, as the structure on this surface is only slightly involved by pathologic changes, the extraction being completed by a buccal application.

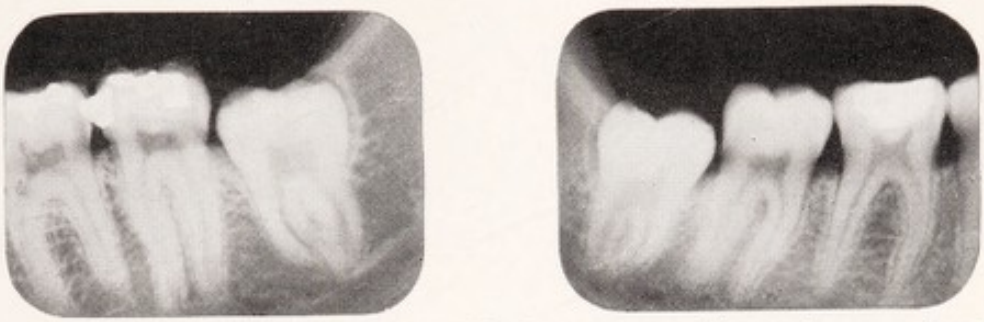


Fig. 404. — Vertical Impaction — No Deflection — Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially. The ossistructure on distal surface extends up to occlusal surface and over greater part of lingual and buccal surfaces.

In the cases shown in Fig. 405 the mesial root is inclined distally and the distal root is inclined mesially, with the ossistructure extending slightly over the distoclusal surface, which is excised in advance of the ossistructure on the distal surface. Excision is also indicated on the buccal surface slightly distal to the bifurcation, as the tooth, by the application of pressure with the exolever to the mesial surface, cannot be raised out of its socket to a point where a buccal application can be made without excision. The mesial surface of the third molar is slightly above the gingival third of the second. As there is only a small septum between the roots, the initial exolever movements are made distally in order to reduce the resistance of the septum, when the tooth is raised to a point where a larger blade can be used and a buccal application is made to complete the extraction.

Fig. 405. — Vertical Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially. The ossistructure extends over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

In the cases shown in Fig. 406 the condition is similar to that shown in Fig. 405, except that the mesial root of the third molar is in contact with the distal root of the second. In this type of case the greater part of the buccal surface is covered by ossistructure, and, to avoid extensive excision on the distal surface, excision is made on the buccal surface distal to the bifurcation, which procedure will allow the application of the exolever to the latter surface. Occasionally there may be a slight buccal deflection, and this condition cannot be determined from a lingual radiogram, but may be determined by an occlusal radiogram. When the exolever is applied to the mesiobuccal surface in order to direct the tooth distally and to fracture the septum between the roots, the case will be complicated by the liability of the mesial root of the third molar being forced against the distal root of the second, and the operator should avoid such an incident by directing the tooth distally only far enough to fracture the septum, and should depend on a buccal application of the exolever to complete the extraction.

Fig. 406. — Vertical Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially. Mesial root in close contact with distal root of second molar and ossistructure extends over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

In the cases shown in Fig. 407, where the roots are fused, a pathologic condition has involved the ossistructure on the distal surface to such an extent that no excision is indicated. The extraction in a case of this kind can be made independent of a mesial application by making a buccal application at the bifurcation with pressure under control, repeating the application if necessary.

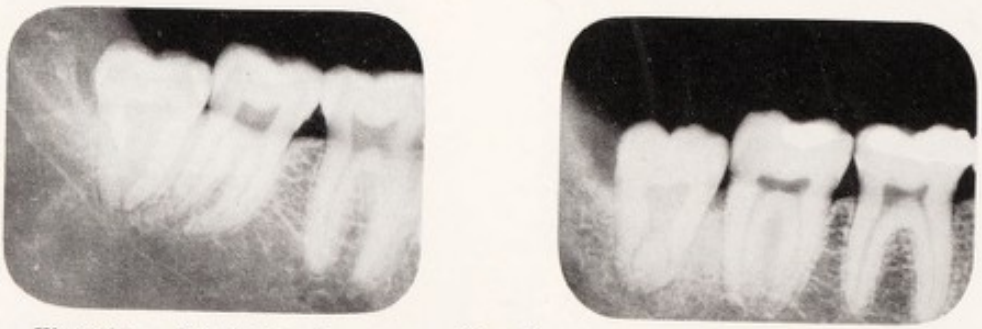


Fig. 407. — Vertical Impaction—No Deflection—Mesial Surface Accessible. Roots fused, with pathologic condition involving ossistructure on distal surface and a variation on lingual and buccal surfaces.

In the case shown in Fig. 408 A, where both roots are straight, a pathologic condition has involved the ossistructure on the distal surface to such an extent that no excision is indicated on this surface. When the exolever is applied to the mesial surface to direct the tooth to a slight extent distally in order to overcome the resistance of the peridental membrane and to loosen the tooth, the extraction movements distally should not be made too forcibly, as a fracture of one or both roots may result. The tooth is, however, directed distally to a point where the resistance will be overcome, when a buccal application is made to complete the extraction. Where the ossistructure on the buccal surface is affected by a pathologic condition, a slight excision is indicated. When making a buccal application with the exolever, the resistance encountered will require repeated applications, the blade being sent farther down on the buccal surface with each application. When the handle of the exolever is pressed downward to direct the tooth upward, the point of the blade

A B

Fig. 408. — Vertical Impaction—No Deflection—Mesial Surface Accessible. *A*, roots straight, with a pathologic condition of ossistructure on distal surface and a variation on buccal and lingual surfaces; *B*, roots practically straight, with ossistructure on distal surface extending up to occlusal surface and over greater part of lingual and buccal surfaces.

should engage the bifurcation and the back of the blade should rest on the superior border of the ossistructure as a fulcrum. Where the operator is proficient in making a buccal application, the extraction can be completed by this procedure independent of a mesial application of the exolever.

In the case shown in Fig. 408 B both roots are straight and the mesial surface is accessible. The ossistructure extends over the greater part of the distal surface, and excision on this surface is indicated before the application of the exolever is made to the mesial surface in order to loosen the tooth. Where the bifurcation is quite a distance from the superior border of the ossistructure, as shown in this case, it is advisable to make an excision of the ossistructure on the buccal surface for the purpose of securing an adjustment of the exolever to this surface.

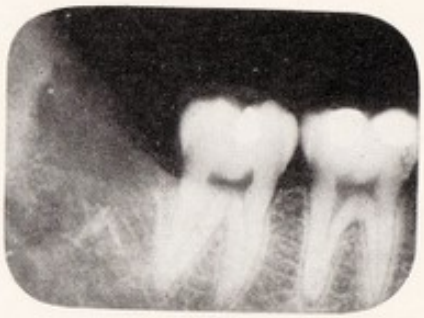
As in the case shown in Fig. 408 A, if the operator is proficient

in making a buccal application, the extraction can be completed by this procedure independent of a mesial application of the exolever, and then no excision of the ossistructure is indicated on the distal surface.

In the case shown in Fig. 409, where both roots are divergent, there is a liability of a fracture of one or both roots, as great resistance may be expected and there is usually a bifurcation of the mesial or distal root. The divergency of the roots indicates that excision should be made on the distal surface, which is slightly involved by pathologic changes, and the exolever technic should be carefully executed. In the application of the exolever to loosen the tooth, the tooth should not be directed too far distally, and dependence is placed entirely on the buccal application to extract the tooth without causing a fracture of either root.

In Fig. 409 A there is no indication of a bifurcation of the roots; in Fig. 409 B is shown the socket after extraction, and in Fig. 409 C is shown the bifurcation of the mesial root.

A



B

C

Fig. 409. — Vertical Impaction—No Deflection—Mesial Surface Accessible. Same case. *A*, both roots divergent; *B*, socket after extraction; *C*, extracted tooth.

In the cases shown in Fig. 410, where the mesial root is straight and the distal root is inclined mesially, the ossistructure on the distal surface is slightly involved by a pathologic condition and no excision is indicated. An application of the exolever to the mesial surface with considerable pressure is liable to fracture the distal root, and the proper technic is to make a buccal application independent of a mesial adjustment and complete the extraction with

a buccal application. There is always the liability of a fracture of the distal root and the operator should be prepared for its extraction.

Fig. 410. — Vertical Impaction—No Deflection—Mesial Surface Accessible. Mesial root straight and distal root inclined mesially, with a slight pathologic condition on distal surface, and greater part of lingual and buccal surfaces free of ossistructure.

In the cases shown in Fig. 411, the operator can treat the tooth as an impacted isolated mandibular third molar, utilizing the broad accessible mesial surface for the application of the exolever, and following the technic described for an isolated third molar where the mesial surface is accessible (page 455). Excision of the ossistructure is indicated over the distoclusal surface, and on the distal and buccal surfaces. Where the exolever technic for an isolated vertical impaction is not permissible, owing to lack of space, a mesiobuccal and a buccal application of the exolever is then indicated.

Fig. 411 — Vertical Impaction—No Deflection—Mesial Surface Accessible. Variation in root formation. The ossistructure extends over occlusal surface, entire distal surface and greater part of lingual and buccal surfaces, with a large space between second and third molars.

In the cases shown in Fig. 412 a pathologic condition has involved the ossistructure on the mesial, distal, lingual and buccal surfaces,

Fig. 412 — Vertical Impaction—No Deflection—Mesial Surface Accessible. Variation in root formation. The ossistructure on mesial, distal, lingual and buccal surfaces involved by a pathologic condition.

but, if the operator attempts an application of the exolever to the buccal surface, which procedure is indicated, following the application of the exolever to the mesial or mesiobuccal surface to direct the tooth distally, he will not be able to accomplish his purpose on account of the lack of a suitable fulcrum. The ossistructure on the buccal surface is therefore excised, in advance of an application of the exolever to this surface, down to a point where a suitable fulcrum can be obtained before an application of the exolever is made to the mesial or mesiobuccal surface in order to direct the tooth distally in conformity with the root formation.

NO DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

Where the third molar is impacted in a vertical position, with the buccal and lingual surfaces in alignment with the corresponding surfaces of the second molar, the mesial surface will be found more frequently accessible than inaccessible to the application of the exolever. Where the mesial surface is inaccessible, the impaction of the tooth will not be shown clinically, as seldom any part of the crown will be exposed, and, as a rule, this type of impaction is not involved by a pathologic condition. Where, however, the ossistructure supporting the tooth is involved by pathologic changes, the ossistructure on the mesial surface will usually be affected, which condition may render this surface accessible, when treatment will be similar to a case where the mesial surface is accessible (page 339). The gum tissue will, however, protect the occlusal surface in most instances, and invasion of bacteria, which does not often occur in this type of case, is not revealed unless a radiogram of the case is made. The presence of this type of impaction is seldom determined by a clinical examination. A great many cases of vertical impaction where the mesial surface is accessible, but where proper attention has not been given to details in the radiogram, will have the appearance of being inaccessible. Where, however, the radiogram has been correctly made and properly defined, few cases of inaccessibility in this type of impaction will be seen.

CLINICAL EXAMINATION

Exposed Crown.—Usually no part of the crown is exposed, but, should there be any exposure, it will be only a small part of the occlusal surface.

Gum Tissue.—The entire tooth is usually covered by gum tissue.

RADIOGRAPHIC INTERPRETATION

Crown.—The radiogram shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. There is no overlap of the mesial surface of the third molar upon the distal surface of the distal root of the second, and there is a variation in the alignment of the occlusal surface of the third molar with the corresponding surface of the second.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root straight, 13; both roots inclined distally, 3; both roots straight, 2; partially developed roots, 2, and mesial root inclined distally and distal root inclined mesially, 2.

Ossistructure.—The ossistructure on the buccal surface in its relation to the mesial surface will interfere with the immediate application of the exolever to this surface, and excision is indicated in order to gain access. In some cases of this type of impaction there will be a space between the second and third molars which will have the appearance of presenting an accessible mesial surface. An examination of the superior border of the ossistructure, compared with the occlusal and mesial surfaces, will, however, show that the mesial surface is inaccessible to the application of the exolever. Many of these cases will cause confusion on account of the conflicting appearance of the accessibility of the mesial surface, and a careful examination of the superior border of the ossistructure will be necessary in order to determine whether the mesial surface is accessible. The ossistructure on the distal surface extends up to the occlusal surface and may in an occasional case entirely cover this surface, and usually extends over the entire buccal surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—As the gum tissue usually covers the entire crown, the incisions are made to conform to the excision of the ossistructure indicated on the mesiobuccal, distal and buccal surfaces. The first incision is made along the mesial surface, thus placing the incision on the distobuccal surface of the second molar or in alignment with the distal surface, and is made downward and buccally to a point that will permit the gum tissue on the mesiobuccal surface to be displaced. The flap should be of such a shape that it will return to its original position on completion of the extraction, and care should be taken not to cause trauma to the gum tissue with the blade of the exolever, as the tissue is to protect the second molar. The second incision is made distally from the starting point of the first

incision, in line with the buccal surface of the third molar, to a point that will permit excision on the distal and buccal surfaces and allow the adjustment of the exolever to the buccal surface. Where it is observed that the gum tissue on the distal surface of the second molar is liable to be disturbed, an incision is made along a part of or the entire distal surface of the second molar from the buccal to the lingual surface in order to avoid injury of the gum tissue on this surface, which can be replaced after the extraction of the impacted tooth (Fig. 413).

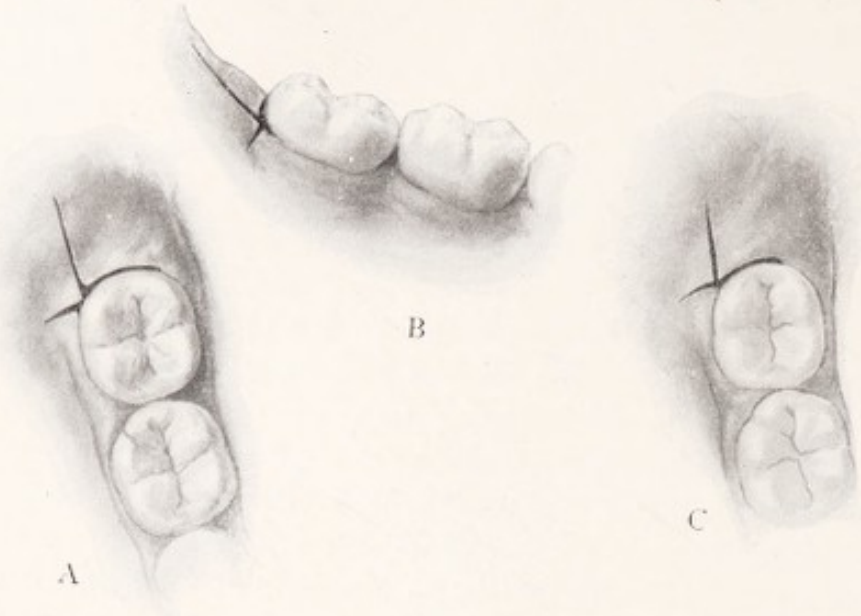


Fig. 413. — Incision of Gum Tissue—Vertical Impaction—No Deflection—Mesial Surface Inaccessible. *A*, incision downward and buccally at distobuccal surface of second molar in alignment with mesial surface where latter surface is in contact with second molar; incision distally along buccal surface of third molar and along distal surface of second, viewed from occlusal; *B*, same incision viewed from buccal; *C*, incision along mesial surface where there is no contact of third molar with second; incision along buccal surface of third molar and on distal surface of second. The latter incision is usually made downward and buccally in alignment with distal surface of second molar.

Ossistructure Technic—Distal Excision.—The depression of the occlusal surface of the third molar below the corresponding surface of the second and the ossistructure on the distal surface of the third molar extending up to the occlusal surface will make access to this surface difficult with the blade of the ossisector, and No. 1L, 3L or No. 1R, 3R is indicated for this excision. The gum tissue over the occlusal surface and on the ossistructure on the distal surface is displaced with the back of the blade of the ossisector, and the excision is made toward the distal surface, sufficient space being created to permit the tooth to be directed distally and upward with the exolever applied to the mesiobuccal surface. The excision is executed in the same manner as when making an excision on the distal surface where there is no deflection and the mesial surface is accessible, as described on pages 342, 343, and illustrated in Figs. 371, 372.

Where the patient is of advanced age or where there is no pathologic condition present, the character of the ossistructure does not permit the structure to be penetrated with an ossisector indicated for a distal excision, and ossisector No. 5L or 5R is indicated, and has been especially designed for this purpose. When used the blade is applied to the center of the ossistructure on the distal surface, then, as pressure is applied, a boring movement is made alternately from right to left. This movement would cover approximately one-quarter of a circle only. A hole is thus readily made which permits further excision with the ossisector indicated for a distal excision (Fig. 414).

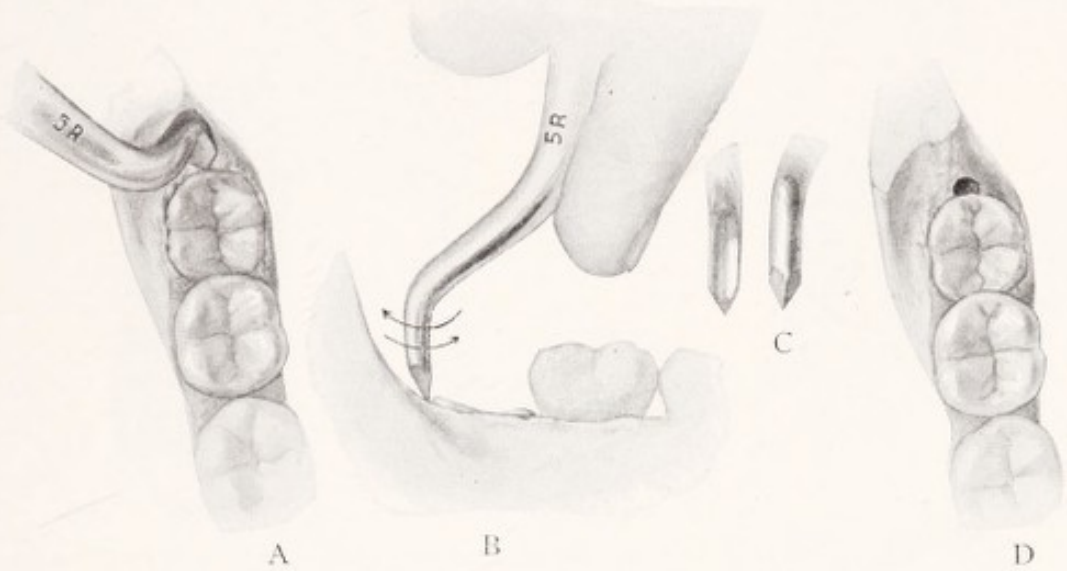


Fig. 414. — Distal Excision of Ossistructure—Vertical Impaction—No Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 5R applied to ossistructure on distal surface, viewed from occlusal. When instrument is applied with pressure a boring movement is made alternating from right to left as shown in buccal view *B*; *C*, front and back views of exolever blade used to penetrate ossistructure; *D*, opening made to permit further excision.

Buccal Excision at or Distal to Bifurcation.—Where the root formation shows that the tooth cannot, by the application of the exolever to the mesiobuccal surface, be directed distally and upward out of its socket to a point where a buccal application of the exolever can be made, excision on the buccal surface is indicated. The excision on the buccal surface is made at or slightly distal to the bifurcation, so that an adjustment of the exolever can be made on this surface at the bifurcation without interference from the superior border of the ossistructure. The excision on the buccal surface is made as in the case where there is no deflection and the mesial surface is accessible (page 350). Care should, however, be taken not to excise to such an extent as to decrease the value of the superior border of the ossistructure as a fulcrum.

Mesiobuccal Excision.—After making the excision on the distal

and buccal surfaces, as described above, the ossistructure on the mesiobuccal surface is excised by using ossisector No. 8L for the left side or No. 8R for the right side (Fig. 357, page 310). The gum tissue on the mesiobuccal surface is displaced with the back of the blade of the ossisector, and the blade is directed toward the mesiobuccal surface, the ossistructure on this surface being excised to such an extent as to allow the application of the exolever with a blade adaptable to this part for the purpose of directing the tooth distally and upward. Care should be taken not to permit the ossisector to come in contact with the distal surface of the distal root of the second molar. The difference in the width of the mesial surface of the third molar and the distal surface of the distal root

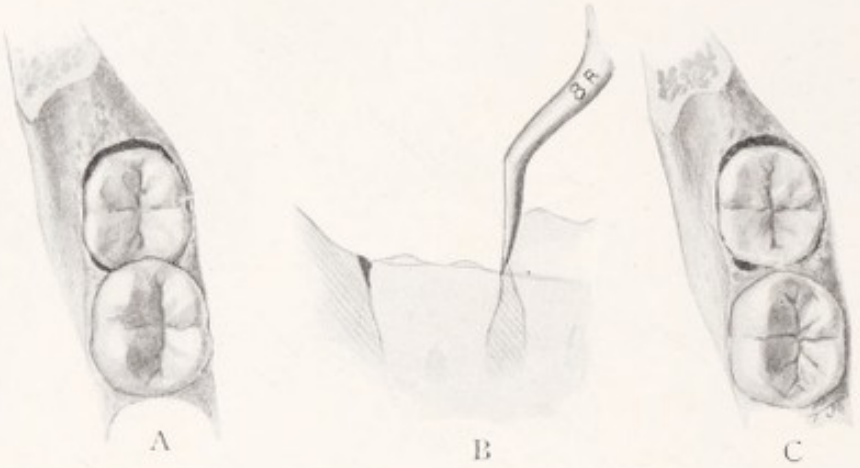


Fig. 415. — Mesiobuccal Excision of Ossistructure—Vertical Impaction—Mesial Surface Inaccessible. *A*, extent and location of excision of ossistructure indicated on mesiobuccal surface, where mesial surface of third molar is in contact with distal surface of second; *B*, ossisector No. 8R applied to mesiobuccal surface for excision; *C*, extent and location of excision where there is an interseptum between second and third molars.

of the second molar is such that often a part of the mesiobuccal surface of the third molar is deflected slightly buccal to the distobuccal surface of the distal root of the second molar. When the condition described above exists, the excision is not difficult to execute. Often a space exists between the mesiobuccal surface and the ossistructure on that surface which has a tendency to decrease the difficulty of excision and often to obviate excision. The existence of this space can often be determined in advance from an occlusal radiogram.

In Fig. 415 A is shown the extent of excision indicated on the mesiobuccal surface where the latter surface is in close contact with the distobuccal surface of the second molar; in Fig. 415 B is shown the ossisector applied for excision, and in Fig. 415 C is shown the extent of excision indicated on the mesiobuccal surface where there is a space between this and the distobuccal surface of the second molar.

Occlusal Excision over Lingual Fourth or Half of Crown.—Where

the ossistructure extends over the lingual fourth or half of the occlusal surface, which condition is often present where the roots are partially developed, the incision is then made with ossisector No. 11L or No. 11R. The gum tissue over the occlusal surface is displaced with the back of the blade, and the excision is made between the occlusal surface and the superior border of the ossistructure. When making this

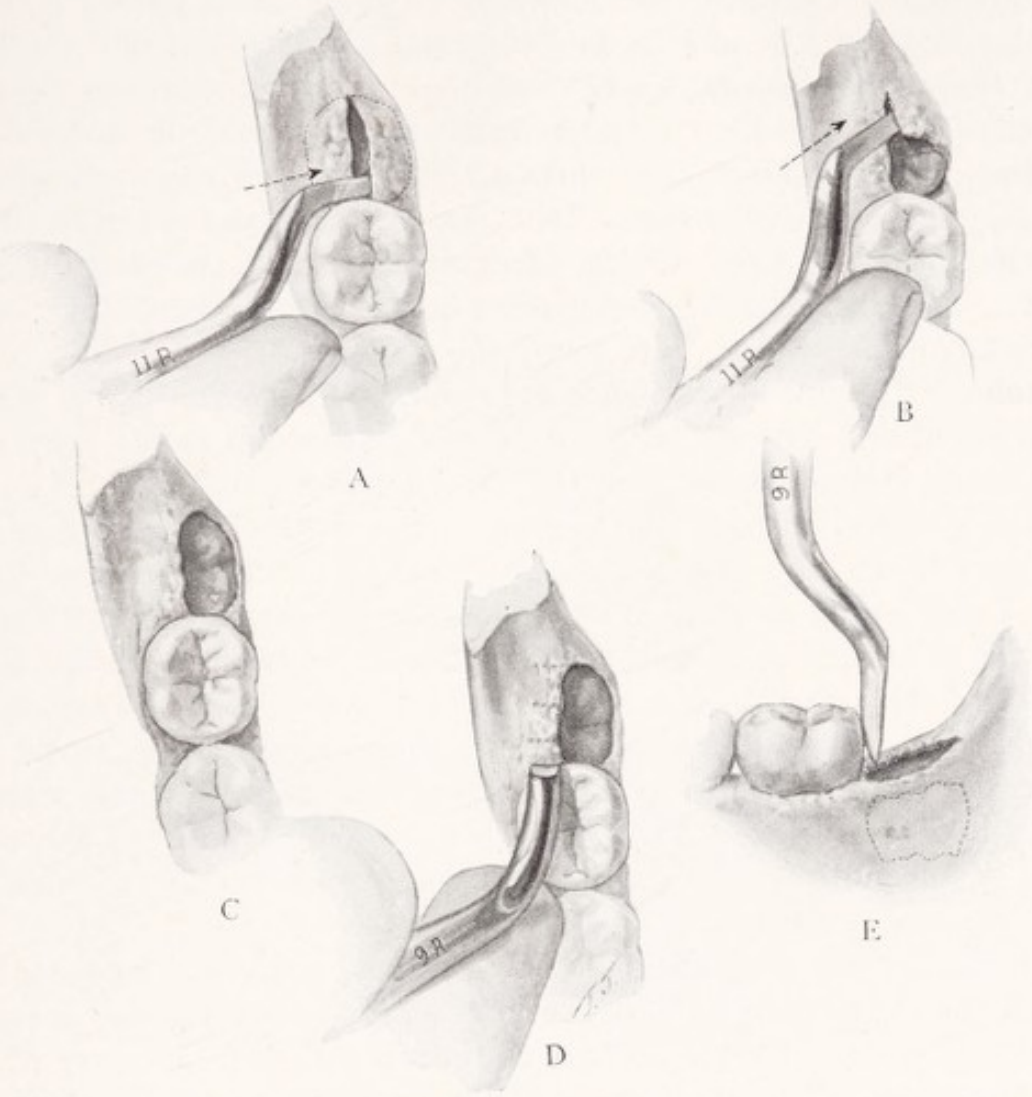


Fig. 416. — Excision of Ossistructure over Lingual and Buccal Fourth or Half of Occlusal Surface—Vertical Impaction—No Deflection—Mesial Surface Inaccessible. Indicated when roots are partially developed, with ossistructure over occlusal surface. *A*, ossisector No. 11R applied for excision of ossistructure over mesiolingual half of occlusal surface; *B*, instrument applied over distolingual half of occlusal surface; *C*, ossistructure over buccal half of occlusal surface; *D*, ossisector No. 9R applied for excision on right side, viewed from occlusal; *E*, application of ossisector, viewed from buccal.

excision the operator should have control of the instrument at all times, so that no injury is done to the gum tissue over the tooth.

In Fig. 416 A is shown ossisector No. 11R applied for excision of the ossistructure over the mesiolingual half of the occlusal surface; in Fig. 416 B the instrument is applied over the distolingual half of the occlusal surface after the structure over the mesiolingual half of the occlusal surface has been excised.

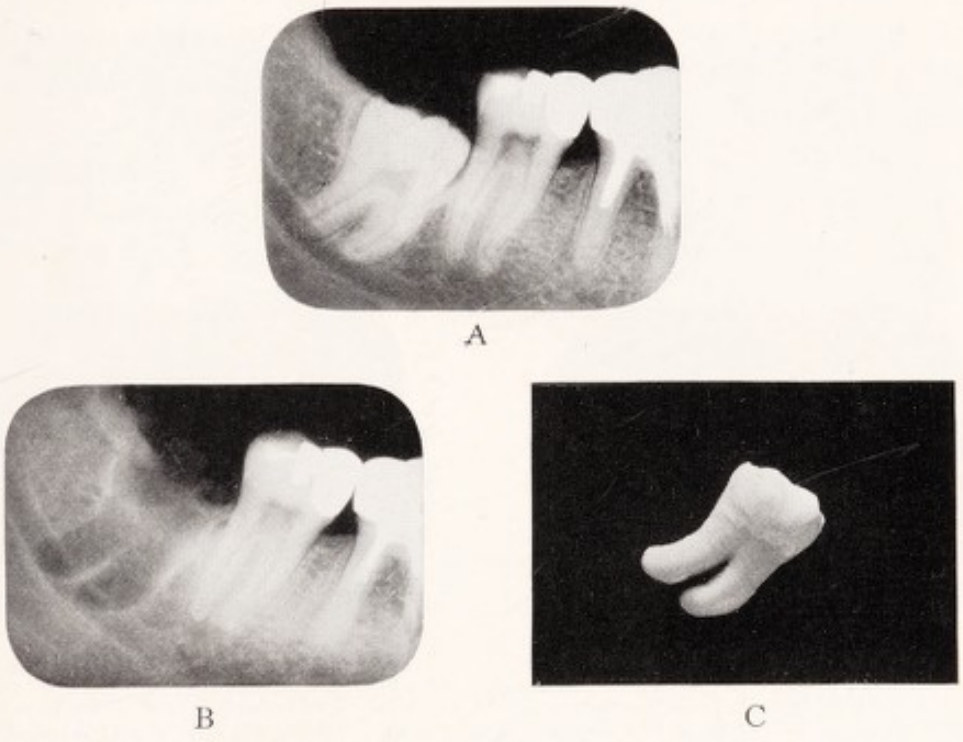
Occlusal Excision over Buccal Fourth or Half of Crown.—Where the ossistructure extends over the buccal fourth or half of the occlusal surface (Fig. 416 C), which condition is found where the roots are partially developed, the excision is then made toward the occlusal surface with ossisector No. 9L for the left side or No. 9R for the right side. The gum tissue over the occlusal surface is displaced with the back of the blade and the excision may be a continuation of the distal excision or it may be started at the mesial surface (Fig. 416 D); Fig. 416 E illustrates a buccal view. The blade is adjusted to the superior border of the ossistructure and a direct excision is made toward the occlusal surface. There is usually a space between the occlusal surface and the superior border of the ossistructure and no difficulty is experienced when excising the structure, as it is not usually very dense. The entire occlusal surface should be free of ossistructure before any attempt is made to apply the exolever.

Exolever Technic—Mesiobuccal Application.—Where the mesial surface is at or below the gingival third of the second molar, if an exolever blade is applied between the mesial surface of the third molar and the gingival third of the distal surface of the distal root of the second, followed by the necessary exolever movements, the distal root of the second molar will be injured, as the latter will not permit pressure to be applied with an exolever as in the case where the distal surface of the crown is engaged to serve as a fulcrum. The exolever blade is adjusted to the mesiobuccal surface of the third molar, the ossistructure anterior being utilized as a fulcrum, and no attempt should be made to use the second molar as a fulcrum until the third molar has been directed distally and upward to the point at which the distal surface of the tooth can be used for that purpose.

The exolever technic for a mesiobuccal application is the same as in the case where there is no deflection and the mesial surface is accessible (page 368), with the technic conforming to the character of the root formation. The application of the exolever to the mesiobuccal surface is made with exolever No. 9L for the left side or No. 9R for the right side, in alignment with this surface and with sufficient pressure to create a wedge, which movement will usually release the tooth from its socket. If resistance is encountered, pressure is applied to direct the tooth distally and upward into the space created by the excision of the ossistructure on the distal surface.

Buccal Application.—If it is observed from the radiographic interpretation that, by the application of the exolever to the mesiobuccal surface, the tooth cannot be directed completely out of its socket without causing a fracture of the roots, exolever No. 10L for the left side or No. 10R for the right side is applied to the buccal surface as in the

case of a buccal application where there is no deflection (page 361). When making the buccal application, the distance for access is greater in this type of case than where the mesial surface is accessible, and, when displacing the gum tissue on the buccal surface, care should be taken not to cause trauma to the tissue. The exolever is sent down on the buccal surface approximately in alignment with the bifurcation of the tooth, and the operator should bear in mind the distance that the tooth has been directed upward and distally by the application of the exolever to the mesiobuccal surface. Repeated applications of the exolever are often indicated, in which case the blade is sent down farther on the buccal surface, the handle of the exolever is pressed downward so as to have the point of the blade penetrate the bifurcation, the back of the blade resting on the superior border of the ossistructure as a fulcrum, and the tooth is directed upward out of its socket.



A B C

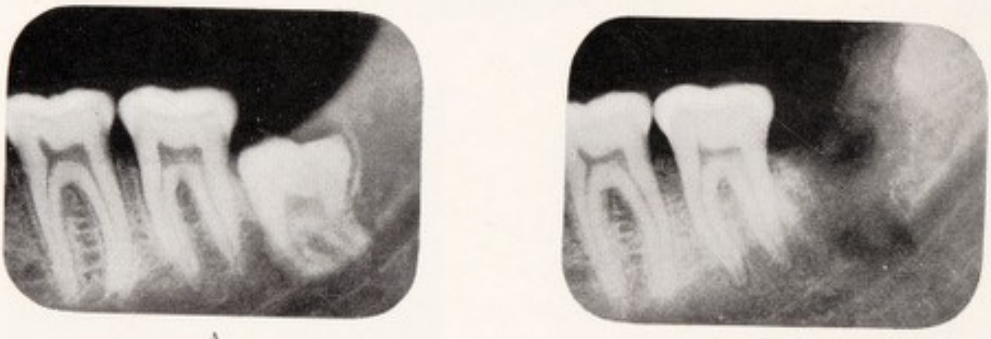
Fig. 417. — Vertical Impaction—No Deflection—Mesial Surface Inaccessible. Same case. *A*, both roots inclined distally. The ossistructure extends over entire mesial, distal, lingual and buccal surfaces; *B*, socket after extraction; *C*, extracted tooth.

SUMMARY OF CASES

In Fig. 417 A is shown a radiogram of a case where both roots are inclined distally and the mesiobuccal surface is inaccessible to the application of the exolever, with a space between the gingival third of the distal root of the second molar and the mesial surface of the third. An imaginary line drawn along the superior border of the ossistructure will, however, show that the mesiobuccal surface of the third molar is inaccessible to the application of the exolever, and that the

instrument cannot be applied without excision. Excision of the ossistructure on the distal surface and on the buccal surface distal to the bifurcation is indicated, on account of the depression of the bifurcation below the superior border of the ossistructure in order to gain access to this surface with the exolever. As both roots are inclined distally, the distance for access is such that extensive excision on the distal surface is obviated by making a buccal application of the exolever to complete the extraction, as the roots are not of extreme length and will permit the tooth to be directed out of its soçket by this application. When excising the ossistructure to gain access to the mesiobuccal surface, the sharp edge of the ossisector is directed, with pressure under control, toward the third molar. The excision is readily made, and only sufficient space is created to allow an exolever blade to be applied to the mesiobuccal surface. The application of the exolever to the mesiobuccal surface of the third molar is made so as not to mar the distal surface of the second, the ossistructure instead of the second molar being depended on as a fulcrum.

In Fig. 417 B is shown a radiogram of the case after extraction, revealing the relation of the roots to the mandibular canal and showing that no injury has occurred to the distal root of the second molar; in Fig. 417 C is shown the extracted tooth.



A B

Fig. 418. — Vertical Impaction—No Deflection—Mesial Surface Inaccessible. Same case. *A*, both roots inclined distally. The ossistructure extends over distoclusal surface and entire mesial, distal, lingual and buccal surfaces; *B*, socket after extraction.

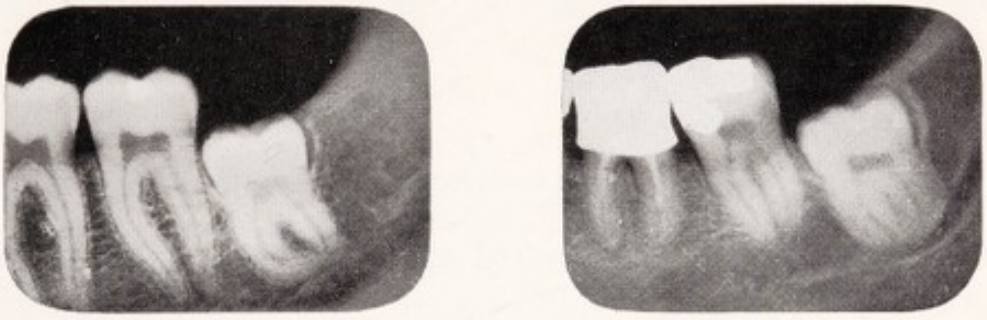
In Fig. 418 are shown two radiograms of the same case, which is similar to that shown in Fig. 417, except that the ossistructure extends over the distoclusal surface and is excised in advance of the excision on the mesiobuccal, distal and buccal surfaces.

In Fig. 418 A is shown the case before operating, and in Fig. 418 B, in which the case is shown after extraction, it will be observed that no injury has occurred to the distal root of the second molar.

In Fig. 419 A is shown a vertical type of impaction, where the mesial surface is inaccessible, with the mesial root inclined distally and the distal root straight, and where the ossistructure extends over the entire

tooth, with the exception of the occlusal surface. Excision of the ossistructure on the distal surface is made quite extensively, and excision is also made on the buccal and mesiobuccal surfaces in order that the exolever may be properly applied to these surfaces. The relation of the mesial surface of the third molar to the distal surface of the second is similar to the case shown in Fig. 417 and the mesial surface has the appearance of being accessible, but the superior border of the ossistructure will interfere with the access.

In Fig. 419 B is shown a case where the ossistructure extends slightly over the distoclusal surface, and excision of the structure is indicated in advance of the excision of the ossistructure on the distal surface, which latter excision is quite extensive in order that, when the exolever is adjusted to the mesiobuccal surface to direct the tooth distally, any resistance that may be presented by the septum between the roots will be overcome. In this case an occlusal radiogram is made to deter-



A B

Fig. 419. — Vertical Impaction—No Deflection—Mesial Surface Inaccessible. *A*, mesial root inclined distally and distal root straight. The ossistructure extends over entire mesial, distal, lingual and buccal surfaces; *B*, mesial root inclined distally and distal root inclined mesially. The ossistructure extends slightly over distoclusal surface and over entire mesial, distal, lingual and buccal surfaces.

mine the probability of a buccal deflection. Where there is a buccal deflection, the case is treated as described for a buccal deflection where the mesial surface is inaccessible (page 410). In addition to the excision of the ossistructure on the distal surface, an excision is made on the buccal surface distal to the bifurcation in order to gain access to this surface with an exolever. Access to the mesiobuccal surface requires excision of the ossistructure, which should be carefully made, so that the distal surface of the distal root of the second molar may not be marred when the exolever is applied to extract the tooth. As the tooth is to be directed distally to fracture the septum between the roots, an exolever is applied to the mesiobuccal surface, after which a buccal application is made to complete the extraction.

In the cases shown in Fig. 420 a pathologic condition has involved the ossistructure entirely around the crown of the third molar. There is also a pathologic involvement of the ossistructure on the greater part of the distal surface of the distal root of the second molar, and it is

questionable whether, after the extraction of the third molar, the second molar will be a serviceable tooth. The technic for the extraction of such a tooth is similar to that described in the case of an isolated mandibular third molar (page 453), as the broad mesial surface is accessible to the application of the exolever. As the occlusal surface is located quite a distance from the superior border of the ossistructure, the pathologic condition of the ossistructure is deceptive for gaining access with the exolever without excision. After the gum tissue has been displaced, it is found that the superior border of the ossistructure is not always involved, and, in order to gain access to the mesial and buccal surfaces, excision is indicated.

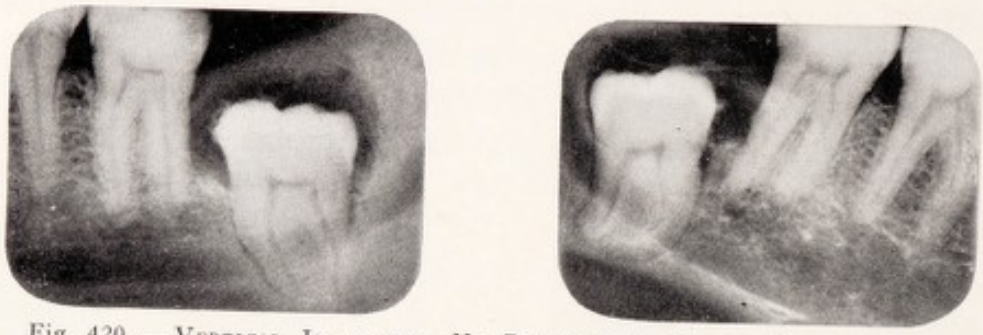


Fig. 420. — Vertical Impaction—No Deflection—Mesial Surface Inaccessible. Variation in root formation. The ossistructure around crown of tooth is extensively involved by a pathologic condition.

Where the case cannot be treated as an isolated tooth, the application of the exolever to the mesiobuccal and buccal surfaces is indicated. Where there is only a limited attachment of the roots and their formation is favorable for a buccal application, the latter can often be followed independent of a mesiobuccal application.

In the case shown in Fig. 421 a pathologic condition has involved the ossistructure on the mesial, distal, lingual and buccal surfaces. Excision is indicated over the distoclusal surface and on the distal and buccal surfaces. The mesiobuccal surface is not always accessible, but the sharp point of the blade of the exolever will usually penetrate through the involved ossistructure, as shown in the occlusal radiogram. The exolever technic for mesiobuccal and buccal applications is indicated in order to complete the extraction.

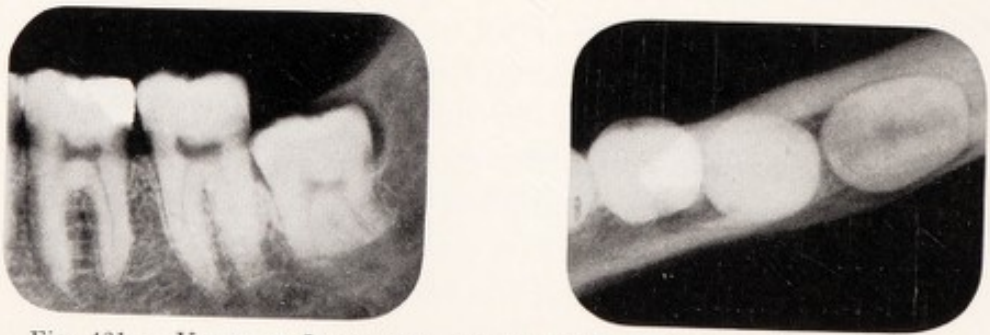


Fig. 421. — Vertical Impaction—No Deflection—Mesial Surface Inaccessible. Lingual and occlusal radiograms of same case. The ossistructure on mesial, distal, lingual and buccal surfaces involved by pathologic condition.

BUCCAL DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

Where the third molar is impacted in a vertical position, with the buccal surface of the crown out of alignment buccally with the corresponding surface of the second, and the mesial surface accessible to the immediate application of the exolever, a condition is presented that is favorable for an exolever technic, but unfavorable for a forceps technic. The extent of the deflection of the buccal surface of the crown of the third molar from alignment with the corresponding surface of the second will vary from a slight deflection to a point, in an occasional case, where the entire crown is deflected buccally out of alignment with the distobuccal surface of the second molar. The tooth, when so deflected, will cause a deflection of part of the mesial surface of the third molar from its approximately normal relation to the distal surface of the second, and the extent to which part of the mesial surface of the crown of the third molar will be deflected buccally out of alignment with the distobuccal surface of the second will vary according to the extent of the deflection of the third molar. In this type of case the application of the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar will obviate the use of the second molar as a fulcrum.

If it is observed by clinical examination and radiographic interpretation that the second molar will not make a suitable fulcrum where the third molar is deflected buccally, the deflection may be turned to an advantage, as it will be possible to utilize the ossistructure anterior to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar as a fulcrum, that surface being used for an adjustment of the exolever. No excision of the ossistructure on the buccal surface is indicated for an adjustment of the exolever to this surface, which condition makes an exolever technic preferable to a forceps technic, as, where the latter instrument is to be used, excision on the lingual and buccal surfaces will be necessary to adjust the beaks of the instrument.

CLINICAL EXAMINATION

Exposed Crown.—A small part of the occlusal or mesial surface may be exposed through the gum tissue.

Gum Tissue.—From a part to the whole of the crown may be covered by gum tissue.

RADIOGRAPHIC INTERPRETATION

Crown.—The enamel cap and pulp chamber are definitely outlined, but no part of the occlusal surface is visible. There is an overlap, at

the contact point, of the mesial surface of the third molar upon the distal surface of the second, which indicates that the third molar is deflected buccally, but, when this condition is checked, no overlap should be shown at the contact point between the first and second molars. There is a variation in the location of the contact between the second and third molars.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root inclined mesially, 7; divergent roots, 4; both roots straight, 3; both roots inclined distally, 3; mesial root inclined distally and distal root straight, 3; fused roots, 3; mesial root straight and distal root inclined mesially, 2, and partially developed roots, 2.

Ossistructure.—There is a variation in the amount of ossistructure on the distal surface, and occasionally this surface is free of ossistructure, owing to a pathologic involvement. Where no pathologic condition is present, the ossistructure on the distal surface usually extends up to the occlusal surface. The ossistructure does not extend over the distoclusal surface in this type of case as frequently as where there is no deflection and the mesial surface is accessible. Rarely is excision on the buccal surface indicated in this type of case, as the deflected crown and the mesial surface available for the adjustment of the exolever to that surface will enable the operator to direct the tooth distally and upward out of its socket to a point where a buccal application can be made without interference of the superior border of the ossistructure. Where the mesial and distal surfaces are involved by a pathologic condition, owing to the position of the tooth, the ossistructure on the buccal surface will also be involved, when excision is indicated on the buccal surface distal to the bifurcation.

OPERATIVE TECHNIC

Gum Tissue Technic.—Where the mesioclusal surface of the third molar is visible, the gum tissue can be displaced with the probe. The extent to which the buccal surface of the crown of the third molar is deflected buccally out of alignment with the corresponding surface of the second should be ascertained, so that the available part of the mesial surface for the application of the exolever can be determined. In addition to this procedure the operator should determine whether it will be necessary to make a slight incision along that part of the mesial surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second, the incision to extend buccally from the buccal surface of the second molar to the corresponding surface of the third, in order that the exolever may be

adjusted to that part of the mesial surface of the crown of the third molar that is deflected buccally out of alignment with the distobuccal surface without injury to the gum tissue. Where no part of the crown is exposed, the mesial surface is located by palpating, when an incision is started slightly anterior to the distal surface of the second molar, the incision being extended buccally to a point determined by the extent of the part of the mesial surface that is out of alignment buccally with the distobuccal surface of the second molar, which point is ascertained with the lancet. When the incision has been made to gain access to the mesial surface, an incision is made distally, starting at the mesial surface and following the buccal surface distally, to a

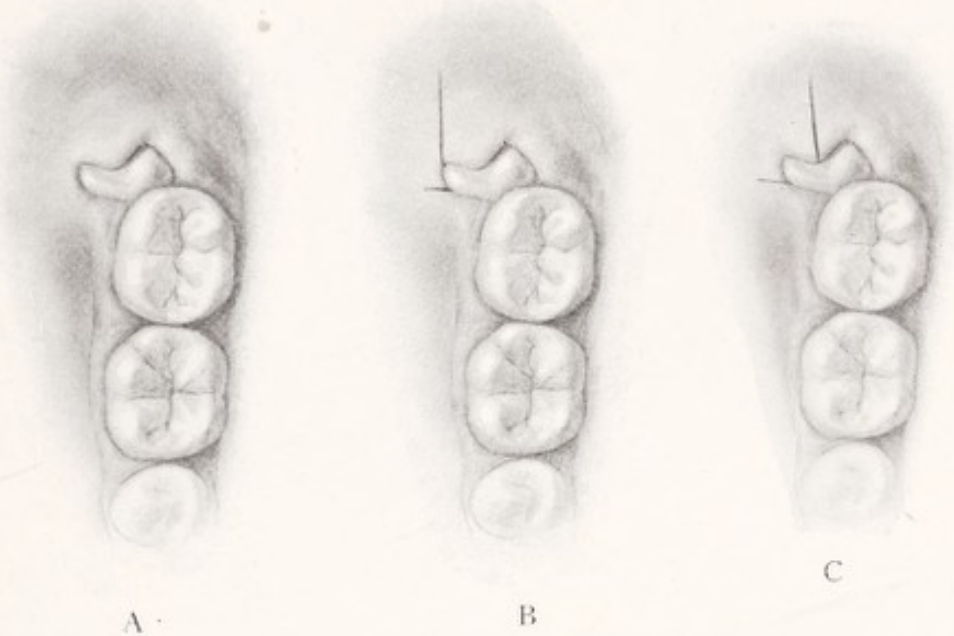


Fig. 422. — Incision of Gum Tissue—Vertical Impaction—Buccal Deflection—Mesial Surface Accessible. *A*, gum tissue over part of occlusal surface where tooth is deflected buccally; *B*, incision made buccally at mesiobuccal surface and distally along buccal surface; *C*, incision made buccally at mesiobuccal surface and distally over center of occlusal surface.

point where the ossistructure on the distal surface can be excised and allow the adjustment of the exolever to the buccal surface.

In Fig. 422 A is shown exposed that part of the crown of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second; in Fig. 422 B is shown an incision made buccal to the mesiobuccal surface and distally along the buccal surface, which incision would be made when a mesial and buccal application is indicated; in Fig. 422 C is shown the incision made buccal to the distobuccal surface and distally over the center of the occlusal surface where no buccal application is indicated. Where the gum tissue extends over the entire crown of the tooth the incision is made as described on page 411.

Ossistructure Technic.—As the mesial surface is accessible to the immediate application of the exolever, no excision of the ossistructure on this surface is indicated. As the crown is deflected buccally, the ossistructure on the distal surface is excised, when indicated, in line with the deflected tooth, but, as the internal and external oblique ridges will often be in close proximity to the crown in a buccal deflection, no excision is made in this area, it being confined to the distal surface (Fig. 423). The technic for excising the ossistructure on the distal surface of the third molar in this type of case is the same as where there is no deflection and where the mesial surface is accessible (page 342). The excision, however, is not so readily executed on account of the density of the ossistructure where the tooth is deflected buccally. No excision of the ossistructure on the buccal surface is indicated in the majority of cases, and, where such a procedure is necessary, the technic is as described on page 350.

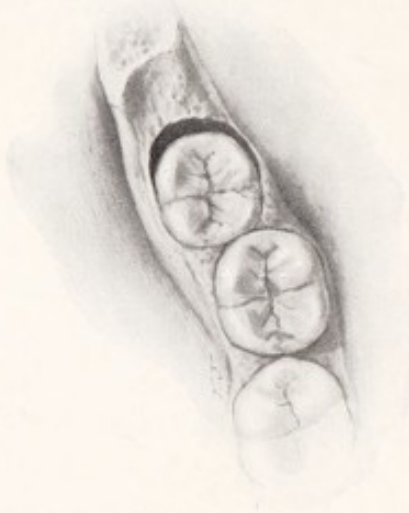
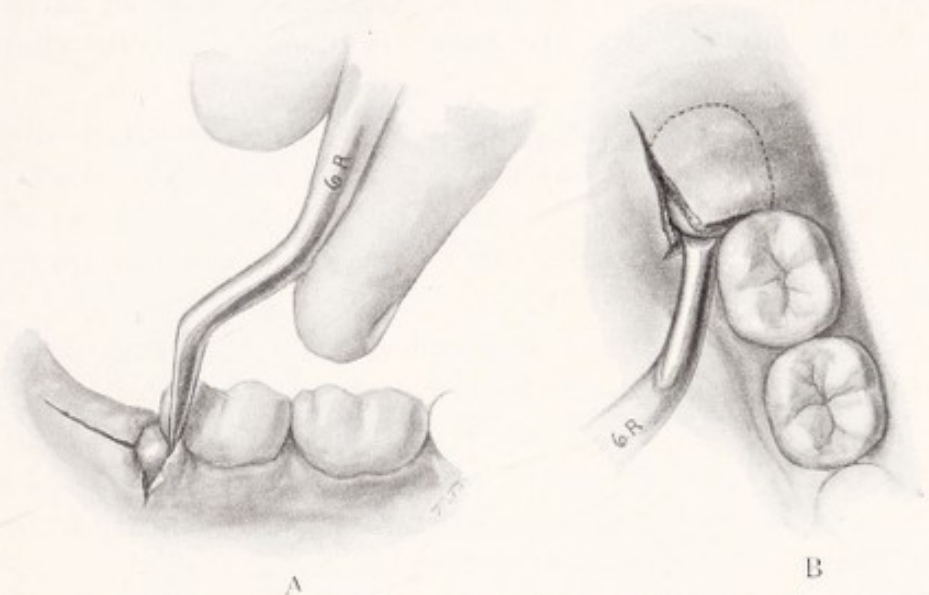


Fig. 423. — Distal Excision of Ossistructure—Vertical Impaction—Buccal Deflection—Mesial Surface Accessible. Excision shown on distal surface where there is a buccal deflection and available ossistructure that can be utilized as fulcrum along that part of mesial surface that is deflected buccally out of alignment with distobuccal surface of second molar.

Exolever Technic—Mesial Application.—In an occasional case, where the crown of the third molar is deflected only to a slight extent buccally out of alignment with the distobuccal surface of the second molar, the deflection will not interfere with the exolever technic described in a case where there is no deflection and where the mesial surface is accessible (page 355), and this technic can be followed. Where, however, in such a case the buccal surface of the crown of the third molar extends a marked distance buccally out of alignment with the distobuccal surface of the second molar, only a small part of the lingual half of the mesial surface of the third molar is in close proximity to the distal surface of the second. The relation of the distal surface of the second molar to the buccal fourth or half

of the mesial surface of the third will not permit the use of the second molar as a fulcrum as readily as where the tooth is not deflected. The deflection will, however, be an advantage, as it will allow the exolever to be applied to that part of the buccal fourth or half of the mesial surface which is accessible without interference from the second molar, and exolever No. 6L for the left side or No. 6R for the right side is indicated (Fig. 338, page 289). The adjustment of the exolever is made to that part of the mesial surface of the crown of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second. The gum tissue on the mesial surface of the third molar, which has previously been incised, is dis-



A B

Fig. 424. — Displacing Gum Tissue with Blade of Exolever—Vertical Impaction—Buccal Deflection. *A*, blade of exolever No. 6R, viewed from buccal, displacing gum tissue and being applied to that part of mesial surface that is deflected buccally out of alignment with distobuccal surface of second molar; *B*, same application, viewed from occlusal, with blade applied downward on that part of mesial surface that is deflected buccally out of alignment with distobuccal surface of second molar.

placed with the back of the blade of the exolever, and the blade is applied to the mesial surface, pressure being exerted downward. The ossistructure anterior to the tooth can be used advantageously as a fulcrum.

The adjustment of the exolever creates a wedge between the ossistructure and the tooth which will raise it partially out of its socket distally and upward, or, if the tooth is not firmly attached, will extract it completely. If the tooth is only partially loosened, the same exolever is sent farther down on the tooth, and the movement is repeated until the tooth is extracted or loosened to an extent that will allow the exolever to be adjusted to the buccal surface to complete the extraction.

In Fig. 424 A is shown the blade of exolever No. 6R, viewed from the buccal, displacing the gum tissue over that part of the mesial

surface that is deflected buccally out of alignment with the distobuccal surface of the second molar after the incision of the gum tissue has been made where it extends over the entire tooth; in Fig. 424 B is shown the blade applied and directed downward, viewed from the occlusal.

In Fig. 425 A is shown exolever No. 6R applied to that part of the mesial surface of the crown of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second, viewed posteriorly; in Fig. 425 B is shown the blade wedged downward between the mesial surface and the ossistructure, thus creating a wedge, a movement which has partially directed the tooth distally and upward; in Fig. 425 C is shown the blade directed farther down on the mesial surface, and the tooth is directed farther distally and upward.

Where both roots are inclined distally, the tooth is directed in conformity with the root formation, and, when the necessary excision of the ossistructure on the distal surface has been made, the tooth can be directed distally out of its socket by the application of the exolever to the mesial surface.

Where the mesial root is inclined distally and the distal root is straight, the exolever technic to direct the tooth distally and upward by the application of the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar should conform to the curvature of the mesial root, but the tooth should not be directed so far distally as to fracture the straight distal root.

Where the roots are fused into a solid mass, the initial application of the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar often has the effect of extracting the tooth by the wedge created between the tooth and the ossistructure.

Where the mesial root is inclined distally and the distal root is inclined mesially, considerable force is applied, when the exolever is adjusted to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, to produce a fracture of the septum.

Where both roots are straight or divergent, the application of the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar is made so as to create a slight wedge movement between the mesial surface and the ossistructure on this surface which will often loosen the tooth. The tooth is then extracted by the application of the exolever to the buccal surface.

Fig. 425. — Mesial Application of Exolever—Vertical Impaction—Buccal Deflection. *A*, exolever No. 6R applied to that part of mesial surface that is deflected buccally out of alignment with distobuccal surface of second molar, viewed posteriorly; *B*, pressure applied downward, thus creating a wedge between that part of mesial surface that is deflected buccally out of alignment with distobuccal surface and ossistructure on this surface, directing tooth to a slight extent distally and upward; *C*, blade applied farther downward, and tooth directed farther distally and upward.

Where the entire crown is completely deflected buccally out of alignment with the arch, which condition is unusual, exolever No. 11L, 11R or No. 12L, 12R is selected, as the deflection where the entire tooth extends buccally beyond the distobuccal surface of the second molar will allow the adjustment of a larger exolever blade.

In the latter type of impaction the gum tissue on the mesial surface of the third molar will offer greater interference with the adjustment of the exolever than where the crown is only partially deflected, and the incision of the gum tissue should extend along the entire mesial surface so that, when it is displaced from the mesial surface with the back of the blade of the exolever, it will not interfere with the adjustment of the instrument. The blade of the exolever is adjusted to the center of the mesial surface of the third molar, the ossistructure anterior to the tooth being used as a fulcrum, the technic being similar to that indicated for an isolated impaction (page 455), and the extraction movement made by turning the handle of the instrument mesially. Repeated extraction movements will be necessary where the roots are markedly divergent distally, and in such a case the blade, on each succeeding application, is inserted farther between the mesial surface of the third molar and the ossistructure on that surface.

Buccal Application.—Where the tooth has been loosened and directed distally and upward by the application of the exolever to the mesial surface, so that no part of that surface is in contact with the distal surface of the second molar, a buccal application is made where the root formation indicates such a procedure in order to avoid a fracture of the roots. A buccal application is made in the same manner as in a case where there is no deflection and where the mesial surface is accessible (page 361). The blade is applied to the buccal surface, the point being directed toward the bifurcation and the superior border of the ossistructure utilized on the buccal surface as a fulcrum. When making the buccal application, care should be taken not to cause trauma to the gum tissue, which covers the greater part of the buccal surface, or to direct the tooth against the second molar.

SUMMARY OF CASES

In Fig. 426 are shown two cases where the tooth is impacted in a vertical position and is deflected buccally, with both roots inclined distally and with an extensive pathologic condition on the distal surface. The involvement is not sufficient to obviate excision, as both roots are inclined distally and there is not enough space to direct the tooth distally in conformity with the root formation, when a slight excision is indicated. The exolever is applied to that part of the mesial

surface of the crown that is deflected buccally out of alignment with the distobuccal surface of the second molar in order to direct the tooth distally out of its socket in conformity with the root formation, the application being repeated, if necessary, to accomplish the purpose.

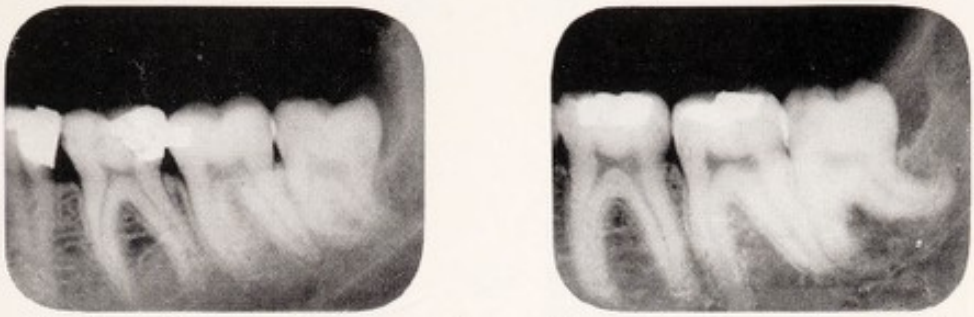


Fig. 426. — Vertical Impaction—Buccal Deflection—Mesial Surface Accessible. Both roots inclined distally, with ossistructure on distal surface involved by a pathologic condition and greater part of lingual and buccal surfaces free of ossistructure.

In Fig. 427 are shown two cases where there is a buccal deflection, with the roots inclined to a slight extent distally at the apical third and fused, and with the ossistructure extending over the distoclusal surface. This ossistructure is excised in advance of that on the distal surface, and the tooth is directed distally to such an extent as to overcome the distal inclination at the apical third by the application of the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar. No attempt should be made in this type of case to direct the tooth completely out of its socket by the application of the exolever to the mesial surface, and the extraction is completed by a buccal application, as the mesial root of the third molar is in close contact with the distal root of the second, and the latter tooth is liable to be loosened if the third molar is directed too far distally.

In Fig. 428 are shown two cases where the tooth is deflected buccally, with the mesial root inclined distally and the distal root straight, and with the ossistructure extending on the distal surface up to the occlusal surface, which structure is excised in advance of the appli-

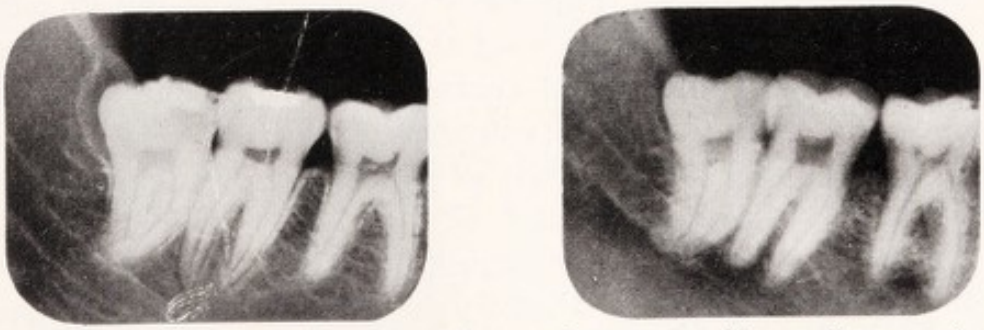


Fig. 427. — Vertical Impaction—Buccal Deflection—Mesial Surface Accessible. Roots fused and inclined distally at apical third. Mesial surface of mesial root in contact with distal surface of distal root. The ossistructure extends over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

cation of the exolever to the mesial surface. The tooth is directed distally and upward in conformity with the curvature of the mesial root by the application of the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, but not so far as to produce a fracture of the straight distal root, when the extraction is completed by a buccal application.

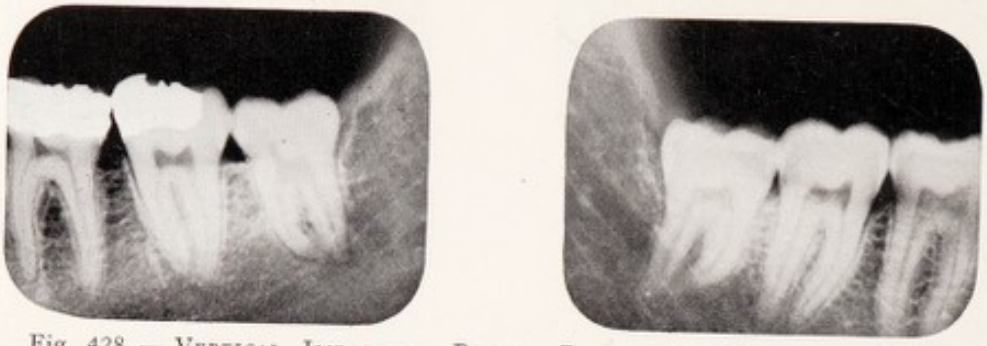


Fig. 428. — Vertical Impaction—Buccal Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight. The ossistructure on distal surface extends up to occlusal surface and over greater part of lingual and buccal surfaces.

In Fig. 429 are shown two cases similar to those shown in Fig. 428, except that the ossistructure extends over the distoclusal surface, and is excised in advance of that on the distal surface.

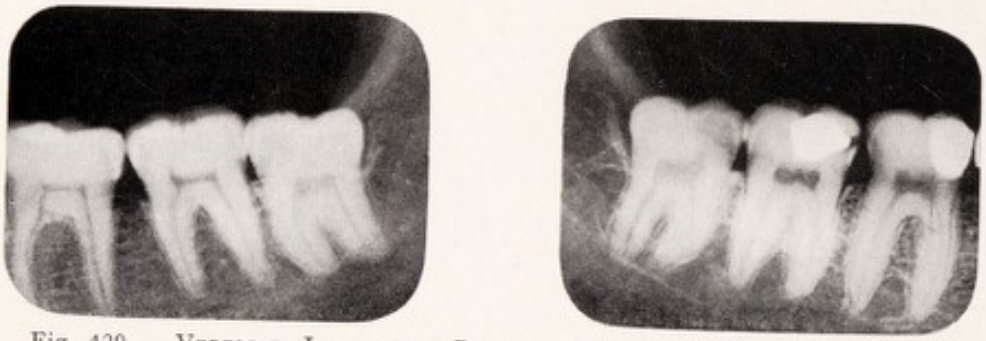


Fig. 429. — Vertical Impaction—Buccal Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight. The ossistructure extends over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

In Fig. 430 are shown two cases where the tooth is deflected buccally, with a complete fusion of the roots. The extent of pathologic involvement on the distal surface is sufficient to obviate excision, and an application of the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, followed by an application to the buccal surface, will complete the extraction. A buccal application independent of a mesial adjustment of the exolever should not be made in this case, on account of the fusion of the second molar roots, as the second molar would be endangered if the third were forced against it by a buccal application.

Fig. 430. — Vertical Impaction—Buccal Deflection—Mesial Surface Accessible. Roots fused, with ossistructure on distal surface extensively involved by a pathologic condition, and greater part of lingual and buccal surfaces free of ossistructure.

In Fig. 431 are shown lingual and occlusal radiograms of the same case where the tooth is deflected buccally, with a complete fusion of the roots. The ossistructure extends over the distoclusal surface, and is excised in advance of that on the distal surface. Extensive excision on the distal surface is not indicated, and only sufficient excision is made to permit the tooth to be loosened by the application of the exo-lever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, when a buccal application is made to complete the extraction.

A B

Fig. 431. — Vertical Impaction—Buccal Deflection—Mesial Surface Accessible. Same case. *A*, roots fused into a conical shape. The ossistructure extends over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces; *B*, occlusal view showing extent of deflection of part of mesial surface buccally to distobuccal surface of second molar.

In Fig. 432 are shown two cases where the tooth is deflected buccally, with the mesial root inclined distally and the distal root inclined mesi-

Fig. 432. — Vertical Impaction—Buccal Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially. The ossistructure on distal surface extends up to occlusal surface and over greater part of lingual and buccal surfaces.

ally. Considerable resistance will be encountered when the tooth is directed distally, and the ossistructure, if it extends over the distoclusal surface and on the distal surface, is excised before the exolever is applied to the mesial surface. When the exolever is applied to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, sufficient force is exerted to fracture the septum between the roots and to direct the tooth distally and upward beyond the superior border of the ossistructure, so that the extraction can be completed by a buccal application.

In Fig. 433 are shown two cases where the tooth is deflected buccally, with a marked divergency of the roots. There is a variation in the character of the ossistructure over the distoclusal surface and on the distal surface, excision being indicated, and, when the exolever is applied to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to execute the extraction movements, only sufficient pressure is exerted to loosen the tooth, the buccal application being depended on to complete the extraction.

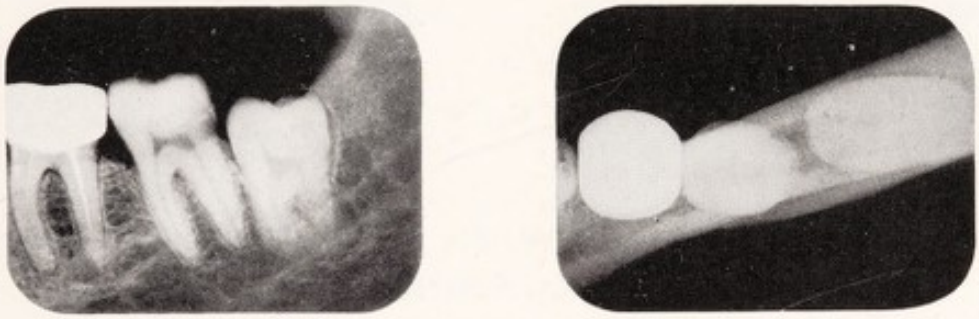
Fig. 433. — Vertical Impaction—Buccal Deflection—Mesial Surface Accessible. Divergency of roots, with a variation in ossistructure on distal, lingual and buccal surfaces.

In Fig. 434 are shown two cases where there is a buccal deflection, with a variation in the root formation, and where a pathologic condition involves the mesial, distal, lingual and buccal surfaces. After the tooth is directed distally by the application of the exolever to that part of the mesial surface that is deflected buccally out of alignment

Fig. 434. — Vertical Impaction—Buccal Deflection—Mesial Surface Accessible. Variation in root formation, with pathologic condition involving ossistructure on mesial, distal, lingual and buccal surfaces.

with the distobuccal surface of the second molar, it will be impossible to make a buccal application on account of the extensive pathologic changes on the buccal surface, and the ossistructure on this surface is excised sufficiently to obtain a suitable fulcrum in advance of the application of the exolever.

In Fig. 435 are shown two radiograms of the same case. In Fig. 435 A is shown a lingual radiogram, where, on account of the mesial inclination of the second molar, no definition of a buccal deflection can be determined, and there is quite a space between the mesial surface of the third molar and the gingival third of the second. In Fig. 435 B the crown is shown deflected buccally, a condition that is quite an advantage in this type of case, as the mesial surface of the mesial root of the third molar is almost in contact with the distal surface of the distal root of the second. The application of the exolever to that part of the mesial surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second will obviate the use of the second molar as a fulcrum, and the latter tooth will not be endangered when the third molar is extracted.



A B

Fig. 435. — Vertical Impaction—Buccal Deflection—Mesial Surface Accessible. Same case where there is a buccal deflection. *A*, lingual view; *B*, occlusal view.

Excision of the ossistructure on the distal surface is indicated, but no excision is necessary on the buccal surface, as the tooth can be directed distally and upward by the application of the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to a distance where a buccal application can be made to complete the extraction.

In Fig. 436 are shown radiograms made before and after extraction, and also a photograph of the extracted tooth. The close contact of the crown and root of the third molar with the greater part of the root of the second molar indicates that precaution should be taken when applying the exolever blade to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, so that the blade will not come in contact with the second molar,

and dependence should be placed on the wedge created by the blade of the exolever. After the tooth has been loosened, a buccal application is made to complete the extraction.

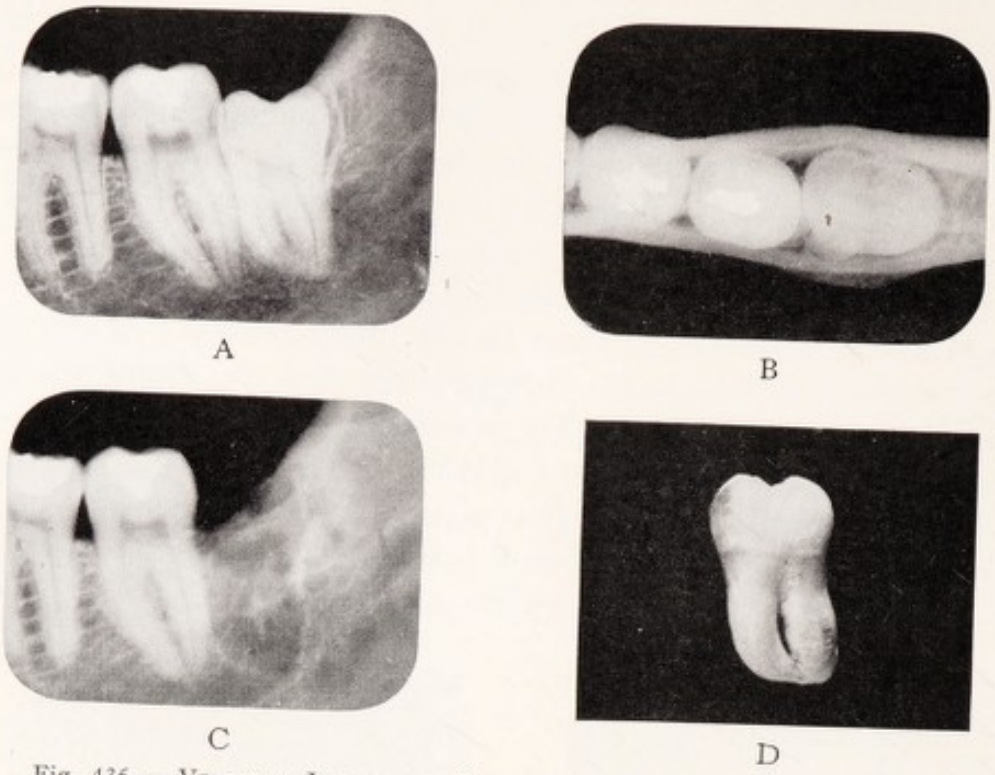


Fig. 436. — Vertical Impaction—Buccal Deflection—Mesial Surface Accessible. *A*, lingual radiogram; *B*, occlusal radiogram; *C*, radiogram made after extraction; *D*, photograph of extracted tooth.

BUCCAL DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

Where the third molar is impacted in a vertical position, with the buccal surface of the crown deflected buccally out of alignment with the corresponding surface of the second molar, and that part of the mesial surface of the crown of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second is inaccessible to the immediate application of the exolever, excision of the ossistructure is necessary in order to adjust the exolever to the mesial surface. This excision can be more readily made than where the buccal surface of the third molar is in alignment with the corresponding surface of the second and the mesial surface is inaccessible. Where the buccal surface of the crown of the third molar is out of alignment with the corresponding surface of the second, excision of the ossistructure on the buccal surface will be unnecessary in the majority of cases. This type of case is not so frequently seen as where there is a buccal deflection and the mesial surface is accessible. The distance of the mesial surface below the superior border of the ossistructure from the occlusal surface down to the gingival third is determined, as the posi-

tion of the tooth will affect the access of the exolever to the mesial surface. The ossistructure anterior to the mesial surface should be especially noted, as it will be an important factor in determining the extent of excision of the ossistructure in order to gain access with the exolever.

CLINICAL EXAMINATION

Exposed Crown.—Rarely is any part of the crown exposed through the gum tissue.

Gum Tissue.—As a rule, the gum tissue covers the entire tooth.

RADIOGRAPHIC INTERPRETATION

Crown.—The enamel cap and pulp chamber are definitely outlined, but no part of the occlusal surface is visible. There is an overlap, at the contact point, of the mesial surface of the third molar upon the distal surface of the second, and this indicates a buccal deflection of the third molar. There is no overlap, at the contact point, of the first molar upon the second, verifying the buccal deflection of the third molar.

Where the mesial root of the third molar is in contact with the distal root of the second, the resultant pressure will deflect the mesial surface of the third molar distally from its contact with the distal surface of the second, and in such a case a buccal deflection of the third molar will usually be present; this cannot be determined in a lingual radiogram and must therefore be checked with an occlusal radiogram.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: both roots inclined distally, 3; both roots straight, 2; mesial root inclined distally and distal root straight, 2; mesial root inclined distally and distal root inclined mesially, 2, and partially developed roots, 1.

Ossistructure.—The mesial surface is inaccessible to the immediate application of the exolever, and there is a variation in the distance of the mesial surface from the superior border of the ossistructure. Pathologic changes do not usually involve the mesial surface, but, if there is such an involvement, it is usually very slight and often renders the mesial surface accessible. The ossistructure on the distal surface is not often involved by a pathologic condition, but, if there is such an involvement, it will extend beyond the gingival third up to the occlusal surface and in some cases over the distoclusal surface. The ossistructure on the buccal surface usually extends over the entire surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—The gum tissue on the distal surface of the second molar in the region of the mesioclusal surface of the third

molar is examined to determine, if possible, the extent of the deflection of the crown buccally out of alignment with the distobuccal surface of the second molar. The incision is started in alignment with that part of the mesial surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second, which is usually anterior to the distal surface of the second molar and is directed along this surface downward and buccally to the buccal surface, being governed by the extent of the deflection of the mesial surface, in order to permit excision of the ossistructure anterior to the deflected mesial surface, so that application of the exolever can be made to this surface. A second incision is made distally, following the buccal sur-

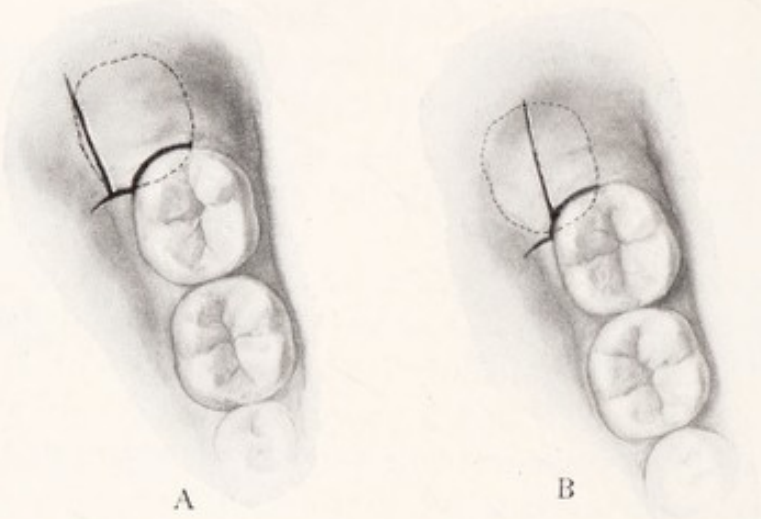


Fig. 437. — Incision of Gum Tissue—Vertical Impaction—Buccal Deflection—Mesial Surface Inaccessible. *A*, incision downward and buccally at distobuccal surface of second molar along that part of mesial surface that is deflected buccally out of alignment with distobuccal surface of second molar, distally along buccal surface of third molar and on buccal half of distal surface of second; *B*, incision downward and buccally at distobuccal surface of second molar, along that part of mesial surface that is deflected buccally out of alignment with distobuccal surface of second molar, distally over occlusal surface in alignment with buccal surface of second molar and on buccal half of distal surface of second molar.

face, to a point that will permit excision of the ossistructure over the occlusal surface and on the distal surface, so that application of the exolever can be made to the buccal surface (Fig. 437 A). Where a buccal application of the exolever is not indicated, incision is made distally over the occlusal surface in alignment with the buccal surface of the second molar (Fig. 437 B). Incision is made on the buccal half of the distal surface of the second molar from the buccal surface to the center of the distal surface in order to avoid causing trauma to the tissue.

Ossistructure Technic—Distal Excision.—The ossistructure on the distal surface usually extends beyond the gingival third and often up to the occlusal surface. On account of the depression of the tooth, access for excision will be difficult, and it cannot be so readily made

as where the ossistructure is more accessible. The extent of the excision will be governed by the character of the root formation, and is confined to the distal surface. Care should be taken not to excise lingually or buccally to the distal surface so as to avoid coming in contact with the internal or external oblique ridge. Excision on the distal surface is made as in the case where there is no deflection (page 342).

Mesial Excision.—When the excision on the distal surface has been made, the ossistructure on that part of the mesial surface of the crown that is deflected buccally out of alignment with the distobuccal surface of the second molar is excised to allow the adjustment of the exolever

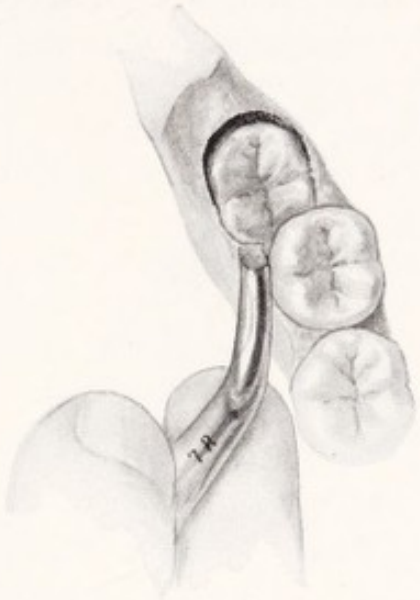


Fig. 438. — Mesial Excision of Ossistructure—Vertical Impaction—Buccal Deflection—Mesial Surface Inaccessible. Ossisector No. 7R applied for excision of ossistructure on that part of mesial surface that is deflected buccally out of alignment wih distobuccal surface of second molar to permit application of exolever at this point.

to this surface, and ossisector No. 7L for the left side or No. 7R for the right side is selected (Fig. 356, page 309). The gum tissue on that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar is displaced with the back of the blade, as in the case where the gum tissue is displaced with exolever No. 6R (Fig. 424, page 401), and the blade is directed toward this surface. When the mesial surface has been reached, the blade is used to determine whether there is a space between the mesial surface and the ossistructure on this surface. Where there is such a space and an exolever can be adjusted, a condition that occurs only occasionally, no excision is made, as the operator should conserve the ossistructure anterior to the mesial surface as a fulcrum. Where there is no space and the progress of the ossisector is stopped by the ossistructure, the blade is inserted slightly anterior to the mesial surface,

and rests on the superior border of the ossistructure when it is directed, with pressure under control, toward that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar (Fig. 438). When the blade strikes the tooth, it is directed anterior to the excised part, and the excision is continued until the mesial surface has been exposed and is accessible to the application of the exolever. Extensive excision should be avoided, and only sufficient excision is made to allow the application of the exolever, as an extensive excision will place the fulcrum too far from the mesial surface and will tend to complicate the use of the exolever.

Buccal Excision.—Rarely is excision on the buccal surface indicated in this type of impaction, as the tooth can be directed out of its socket distally and upward, by an application of the exolever to the mesial

Fig. 439. — Occlusal Excision of Ossistructure — Vertical Impaction — Buccal Deflection—Mesial Surface Inaccessible. Ossistructure over buccal half of occlusal surface when crown is deflected buccally in that type of case where roots are partially developed.

surface, to a point where the superior border of the ossistructure will not interfere with a buccal application of the exolever. Should a case be presented where excision is indicated on the buccal surface, the excision is made distal to the bifurcation from the superior border of the ossistructure down to a point where the exolever can be adjusted at the bifurcation, and is made in the same manner as in the case of buccal excision (page 350).

Occlusal Excision.—Where the ossistructure extends over the disto-clusal surface and in some cases over the buccal half of the occlusal surface, it may not be clearly discernible in the radiogram. Where the roots of the tooth are partially developed the structure often extends over the buccal half of the occlusal surface, a condition which can be determined in the radiogram (Fig. 439). Where the condition described above exists, the excision over the buccal half of the occlusal surface is made by directing ossisector No. 9L for the left side or No.

9R for the right side, after the gum tissue has been displaced, toward the occlusal surface with pressure under control. The excision is made as in a case where the ossistructure extends over the buccal fourth or half of the occlusal surface and there is no deflection (page 392). As the structure over the buccal half is often a part of the external oblique ridge, there is a variation in the density of the structure, but as there is usually a space between the occlusal surface and the superior border of the ossistructure, pressure exertion on the handle, with the blade resting on the superior border, will usually be sufficient to penetrate through the structure. No part should remain and the occlusal surface should be free of ossistructure from the distal to the mesial surface on the buccal half of the crown. Where the ossistructure extends over the distoclusal surface, the excision is made as described on page 349.

Exolever Technic.—When the excision on the mesial, distal and (when indicated) buccal surfaces has been made, the exolever technic is executed as described for a mesial application in a buccal deflection where the mesial surface is accessible (page 400), application being made to that part of the mesial surface which has been made accessible by the excision of the ossistructure. The tooth is directed distally and upward in conformity with the root formation, and a buccal application of the exolever is made as in a case where such an application is indicated by the root formation, which procedure is described on page 361.

SUMMARY OF CASES

In Fig. 440 is shown a case where the tooth is deflected buccally and the mesial surface is inaccessible to the immediate application of the exolever. Excision of the ossistructure over the distoclusal surface and on the distal surface and also excision to gain access to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar is indicated. The application of the exolever is made to the mesial surface in order to direct the tooth distally and upward in conformity with the

Fig. 440.—Vertical Impaction—Buccal Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root straight. The ossistructure extends over part of distoclusal surface and entire mesial, distal, lingual and buccal surfaces.

root formation, and the extraction is completed by a buccal application. No excision on the buccal surface is necessary to adjust the exolever to this surface.

Where in a lingual radiogram there appears to be no deflection, but where there is a contact of the roots of the second molar with the roots of the third, or a mesial inclination of the second molar, it is not unusual to find a buccal deflection, and such a case should always be checked with an occlusal radiogram.

LINGUAL DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

A case is frequently seen where the third molar is impacted in a vertical position, with the buccal surface of the crown deflected to a slight extent lingually out of alignment with the corresponding surface of the second molar, and with the mesial surface of the third molar accessible to the immediate application of the exolever. In such a case the lingual deflection will not be obstructed by any part of the crown of the third molar coming in contact with the distobuccal surface of the second. Where the buccal surface of the third molar is deflected to a slight extent lingually out of alignment with the corresponding surface of the second, there will be also a lingual deflection of the occlusal surface of the third molar compared with the corresponding surfaces of the first and second molars. In this type of impaction the third molar will not be deflected lingually to such an extent that the radiogram will show a foreshortening of the roots, as is the case where the tooth assumes a marked linguoangular inclination and where a foreshortening of the roots is shown in the radiogram.

In the cases mentioned above an occlusal radiogram is made to verify the lingual deflection, as occasionally the deflection may be reversed, so that the occlusal surface is presented toward the buccal instead of toward the lingual side of the arch. In the majority of these cases, however, the tooth is deflected lingually. If the radiogram has not been correctly made, the tooth will appear elongated and no part of the occlusal surface will be visible. The condition may be mistaken for a case where the third molar is not deflected and where the buccal and lingual surfaces are in alignment with the corresponding surfaces of the second molar. In such a case the lingual deflection will not be shown until the gum tissue has been displaced and the crown has been exposed.

In Fig. 444, page 424, is shown a case where a mistake can be made in determining the character of the impaction. The radiogram shown in Fig. 444 A has been correctly made, presenting the first and second

molars of approximately normal size and in alignment, with no overlap at the contact point, the enamel caps and pulp chambers being definitely outlined, and part of the occlusal surface of the third molar being visible. In Fig. 444 B is shown the same case, but the first and second molars are elongated and no part of the occlusal surface of the third molar is visible, and it appears as if the tooth were not deflected lingually.

As the occlusal surface of the third molar is deflected lingually, and a part of the buccal surface is also deflected lingually out of alignment with the corresponding surface of the second molar, the relation of the mesial surface of the third molar to the distal surface of the second will not permit the initial application of an exolever with a large blade to be made to the mesial surface of the third molar as in the case where the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second. Where the third molar is deflected lingually, the second molar is utilized as a fulcrum in the greater number of cases. The part of the distal surface of the second molar that may be available as a fulcrum is limited on account of the character of the deflection. In an occasional case the buccal surface of the crown will not be deflected lingually and only the occlusal surface is directed toward the lingual and then the buccal surface will be out of alignment to a slight extent buccally with the distobuccal surface of the second molar.

CLINICAL EXAMINATION

Exposed Crown.—A part of the occlusal, mesial or buccal surface is often exposed.

Gum Tissue.—Rarely does the gum tissue cover the entire crown, and some definition of the alignment of the tooth can usually be obtained by a clinical examination. When, however, the entire tooth is covered by gum tissue, the extent of the deflection can often be determined by palpation.

RADIOGRAPHIC INTERPRETATION

Crown.—A part of the occlusal surface is visible, but not so much of it can be seen as in a linguoangular or complete lingual impaction. The lingual deflection of the third molar is checked with the first and second molars, and it will be observed that there is no overlap, at the contact point, of the first molar upon the second. The enamel caps and pulp chambers of these two teeth are definitely outlined, but no part of their occlusal surfaces is visible. There is no overlap of the mesial surface of the third molar upon the distal surface of the second, but there is a variation in the location of the mesial surface of the third molar in its relation to the distal surface of the second.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root straight, 25; mesial root inclined distally and distal root inclined mesially, 20; both roots inclined distally, 13; fused roots, 10; divergent roots, 7; both roots straight, 3; mesial root straight and distal root inclined mesially, 2; mesial root straight and distal root inclined distally, 2, and partially developed roots, 2.

Where the mesial root is inclined distally and the distal root is straight, a fusion of the roots with a hypercementosis involvement is of frequent occurrence, and considerable resistance will be presented in the execution of the exolever movements. In this type of impaction particular attention should be given to the root formation, as considerable resistance will be presented where the roots are of extreme size and where there is a large septum. The exolever movements cannot be readily executed on account of the limited distal surface of the second molar that can be used as a fulcrum, and the ossistructure on the buccal surface is, as a rule, not very heavy and is not dependable for that purpose.

Ossistructure.—The mesial surface is accessible to the application of the exolever, and no excision of the ossistructure on this surface is indicated. In some cases pathologic changes have not destroyed the ossistructure on the distal surface to an extent that will permit the tooth to be directed distally in conformity with the root formation, and excision of the ossistructure on the distal surface is indicated. Where the superior border of the ossistructure on the buccal surface will interfere with an application of the exolever, excision of the ossistructure distal to the bifurcation on the buccal surface is indicated. Excision on the buccal surface is also indicated where the ossistructure on this surface is thin and where consequently no dependence can be placed on it as a fulcrum to support the blade of the exolever. A pathologic condition frequently involves the mesial and distal surfaces in this type of case, and, if present, the ossistructure on the buccal surface is usually involved, when excision is indicated on the buccal surface to insure a secure fulcrum. The ossistructure may extend over the distoclusal surface, and, when this condition exists, it may be over a part of or over the entire lingual fourth or half of the occlusal surface and should be excised in advance of the excision on the distal surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—The extent of the lingual deflection of the occlusal surface of the third molar and the alignment of the buccal

surface with the corresponding surface of the second molar is determined, wherever possible, by the exposed part of the crown. Where it is observed that the exolever can be applied to the mesial surface without causing trauma to the gum tissue, no incision is indicated. Where, however, the application of the exolever to the mesial surface will injure the gum tissue, an incision is made on the buccal half of the distal surface of the second molar, extending to a slight extent downward and buccally. Another incision is made in alignment with the deflected buccal surface of the third molar, and this alignment may vary from a short distance from the buccal surface of the second molar lingually to an alignment with the center of the distal surface of the second molar (Fig. 441). The latter incision is made distally to a point that will permit excision of the ossistruc-

Fig. 441. — Incision of Gum Tissue—Vertical Impaction—Lingual Deflection. Incision distally along buccoclusal surface and downward and buccally along buccal half of distal surface of second molar.

ture on the distal surface and allow the application of the exolever to the buccal surface. Where the gum tissue extends over the entire tooth the incision is made as described for a vertical impaction, lingual deflection, with the mesial surface inaccessible (page 432).

Ossistructure Technic—Distal Excision.—No excision of the ossistructure on the mesial surface of the third molar is necessary in order to gain access to this surface with the exolever. The excision on the distal surface is the same as in a case where there is no deflection of the third molar (page 342), except that the excision of the ossistructure should conform to the lingual deflection of the distal surface of the crown. After the gum tissue on the distal surface has been displaced with the back of the blade, excision is made toward the distolingual surface, as often in a case where a pathologic condition involves the ossistructure on the distal surface a small solid section of the ossistructure that was not shown in the radiogram

will remain, which will be an interfering factor, and the excision is made as illustrated in Fig. 373, page 348. The excision on the distal surface should be sufficient to permit the tooth to be directed distally far enough to overcome the resistance of the root formation and septum. When applying the ossisector for a distal excision, the blade, after the gum tissue over the occlusal surface has been displaced, is directed along this surface, following the buccal surface of the third molar until the distal surface has been reached, when the blade is directed distally to the part to be excised. By this course unnecessary excision is avoided and the alignment is not lost.

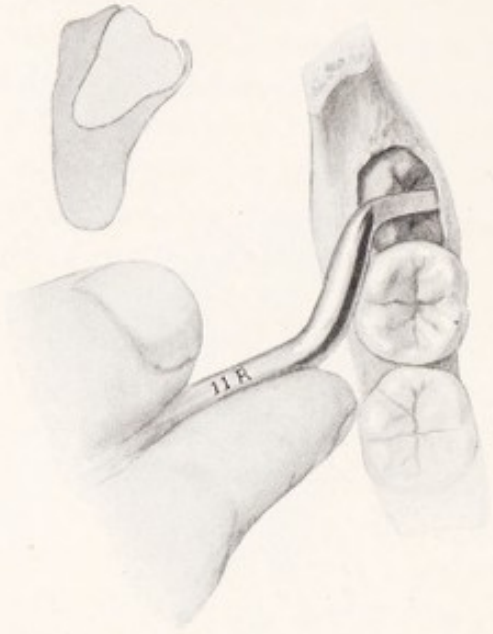


Fig. 442. — Excision of Ossistructure over Lingual Fourth or Half of Occlusal Surface—Vertical Impaction—Lingual Deflection. Ossisector No. 11R applied for excising ossistructure extending over lingual fourth of occlusal surface of third molar.

Occlusal Excision.—Where the ossistructure extends over the distoclusal surface, it may also extend along a part of or along the entire lingual fourth or half of the occlusal surface, and if this structure is not excised it will be an interfering factor when the exolever technic is executed. It is not so practicable to make the excision toward the occlusal surface as where the structure is over the buccal fourth or half of this surface, but the excision is made by directing the blade between the superior border of the ossistructure and the occlusal surface, as usually there is a space present which will permit the blade of ossisector No. 11L for the left side or No. 11R for the right side to be wedged between the occlusal surface and the superior border of the ossistructure, and, if the structure is not dense, it will usually be fractured away. The excision is started at the center of the linguoclusal surface (Fig. 442 A), and, if the ossistructure is not fractured away when the blade is wedged between the tooth and the

ossistructure, pressure with the instrument under control is applied, an excision being made toward the lingual. The excision is readily made and is continued over the entire lingual fourth or half of the occlusal surface in order that no ledges will extend over the occlusal surface at this point. Where the roots are partially developed and the ossistructure extends over the lingual half of the occlusal surface, the same technic is followed as described above.

Buccal Excision.—No excision on the buccal surface is necessary where the ossistructure on this surface does not extend beyond the gingival third, or where the exolever, when applied to the mesial or mesiobuccal surface, will direct the tooth distally and upward to a point where the superior border of the ossistructure will not interfere with the application of the exolever. Where it is observed that the superior border of the ossistructure will interfere with a buccal application of the exolever, excision is made on the buccal surface, and the technic is the same as described on page 350. When executing this excision, the alignment of the buccal surface should be positively determined, and the application of the ossisector should be made with caution, as the ossistructure on the buccal surface where the tooth is deflected lingually is not so heavy as where the third molar is in alignment with the second or where the tooth is deflected buccally. There is a liability that the ossisector blade, when applied to the buccal surface, may slide over the ossistructure on the buccal surface and injure the gum tissue. To avoid this incident the blade of the ossisector is inserted as a wedge between the buccal surface and the ossistructure on this surface, and this will have the effect of loosening the tooth, and, where there is not a large septum between the roots, the tooth can be extracted by this procedure (Figs. 457 A, 457 B, page 433).

Where the ossistructure extends over the distoclusal surface, excision is made in advance of the excision on the distal surface, and is executed as in the case where there is no deflection (page 349). Where a pathologic condition involves the ossistructure on the mesial, distal, lingual and buccal surfaces, the ossistructure on the buccal surface will not, as a rule, make a suitable fulcrum, and excision on this surface is indicated down to a point where a secure fulcrum can be obtained.

Exolever Technic—Mesial Application.—Rarely is the mesial surface of the third molar in this type of impaction in contact with the distal surface of the second molar, but, if there is a contact, it will be very slight. The lingual deflection is, however, of such a character and the interproximal space is of such a size that the large exolever blade used for a mesial application where there is no deflection is not

adaptable for entering the interproximal space, and the use of the second molar as a fulcrum, on account of the limited surface available in such a case, is not so advantageous. Before applying the exolever the operator should be certain that no ledges of ossistructure extend over the lingual fourth of the occlusal surface, as shown in Fig. 443 A. Exolever No. 1L for the left side or No. 1R for the right side is selected for the initial extraction movement. On account of the lingual deflection of the third molar, the mesial surface is not so readily accessible as where the buccal surface of the third molar is in alignment with the corresponding surface of the second, and the progress of the instrument is stopped by the mesial surface of the third molar, as the extent of surface to which the exolever can be applied is limited.

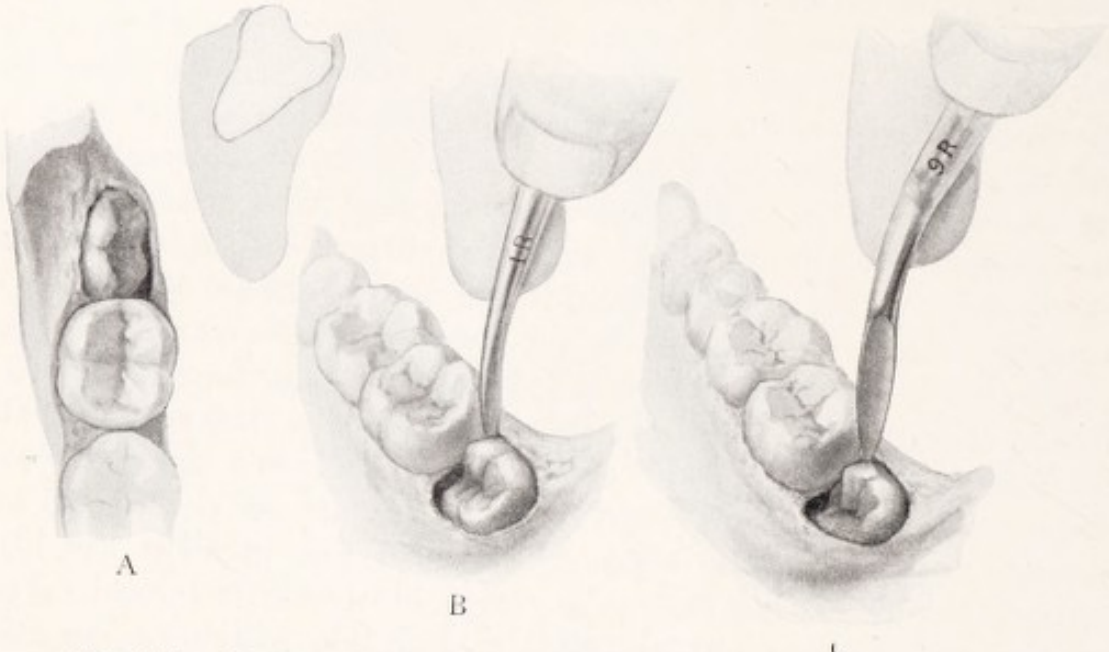


Fig. 443. — Vertical Impaction—Lingual Deflection—Mesial Surface Accessible. *A*, lingual deflection of third molar, with a ledge of ossistructure extending over lingual fourth of occlusal surface, and also shows relation of mesial surface of third molar to distal surface of second; *B*, exolever No. 1R applied to mesial surface after excision has been made over lingual fourth of occlusal surface and on distal surface; *C*, exolever No. 9R applied to mesiobuccal surface after excision has been made over lingual fourth of occlusal surface.

When the necessary excision of the ossistructure on the distal and buccal surfaces has been made, exolever No. 1L for the left side or No. 1R for the right side is applied (Fig. 443 B). The gum tissue on the buccal surface is displaced with the back of the blade, consideration being given to the distance between the buccal surface of the third molar and the corresponding surface of the second, which condition will place the mesial surface of the third molar, the objective point for the application of the exolever, at various distances from an approximately normal position. The blade is directed, with pressure under control, into the interproximal space between the second and third molars, and a wedge movement is applied to direct the tooth distally.

The handle of the exolever is turned mesially, thus directing the tooth distally to the space made by the excision of the ossistructure on the distal surface. The blade is adjusted to the gingival third of the third molar, when the handle of the instrument is turned farther mesially to raise the tooth upward out of its socket. Where the roots are large and the resisting septum will not permit the tooth to be directed distally far enough with exolever No. 1L or 1R, with which the tooth has been partially directed distally and upward, on account of the blade not being large enough and the fulcrum having been lost, exolever No. 2L, 3L or No. 2R, 3R is applied to complete the exolever movement. The turning of the handle mesially is repeated in order to direct the tooth farther distally, in conformity with the root formation, to the space created on the distal surface, and a buccal application is made to complete the extraction.

Where both roots are inclined distally, and it is observed that the tooth can be extracted by the application of the exolever to the mesial surface, the extraction movements are repeated until the tooth has been directed out of its socket. Where the root formation is of a character that will prevent the tooth from being directed out of its socket by the application of the exolever to the mesial surface without causing a fracture of the crown or roots, the tooth is directed distally and upward to a point where a buccal application of the exolever can be made to complete the extraction.

Mesiobuccal Application.—The lingual deflection of the buccal surface of the crown in some cases may not be so marked and the mesiobuccal surface may then be available for a mesiobuccal application of the exolever, which should be done, where possible, in preference to a mesial application. This application will obviate the use of the second molar as a fulcrum, and is especially indicated where the roots are large or hypercementosed. The instrument is applied as shown in Fig. 443 C, and the extraction movements are followed as described for a mesiobuccal application (page 368).

Buccal Application.—When the tooth has been directed out of its socket to a point where a buccal application of the exolever can be made, the operator should be certain that the bifurcation of the tooth is raised far enough above the superior border of the ossistructure to allow this application; but, if the bifurcation has not been raised to such an extent, excision of the ossistructure on the buccal surface is necessary. When making the buccal application of the exolever, the alignment of the buccal surface of the third molar, which is lingual to the buccal surface of the second, should be borne in mind. As the ossistructure on the buccal surface is usually very thin where the tooth is deflected lingually, the structure may be of a deceptive char-

acter, and, when making the buccal application of the exolever, the progress of the blade may not be stopped by the superior border of the ossistructure and the blade will travel buccally over the structure, causing considerable damage. This incident may occur where there has been no excision on the buccal surface, where the height of the superior border of the ossistructure has not been determined in advance of the operative procedure and where sufficient excision has not been made to secure a suitable fulcrum. The operator should be certain that the buccal surface is free of ossistructure to a point where a suitable adjustment of the exolever can be made at the bifurcation and where a secure fulcrum can be obtained. When the exolever has been adjusted, the extraction movements will be the same as in a case where there is no deflection (page 361). When directing the tooth out of its socket by a buccal application, a slight lingual pressure may be applied, as the lingual plate is usually very thin in these cases, or there may be no ossistructure on the lingual surface from the occlusal surface down to the gingival third, and directing the tooth to a slight extent lingually will often simplify the operative procedure.

SUMMARY OF CASES

In Fig. 444 are shown two radiograms of the same case. In Fig. 444 A is shown a correctly made radiogram, where a part of the occlusal surface of the third molar is visible, showing the first and second molars to be of approximately normal size, with definite enamel caps, but no part of the occlusal surfaces of these two teeth is visible. In Fig. 444 B is shown an incorrectly made radiogram, where no part of

A B

Fig. 444. — Vertical Impaction—Lingual Deflection—Mesial Surface Accessible. Same case. *A*, correctly made radiogram; *B*, incorrectly made radiogram.

the occlusal surface of the third molar is visible, the tooth having the appearance of being in a vertical position, with no deflection of the crown, and there is an elongation of the second molar.

In Fig. 445 are shown two cases where the tooth is deflected lingually, both roots being inclined distally, with the ossistructure extending over the distoclusal surface, and excision over this surface and on

the distal surface is indicated. The greater part of the buccal surface is covered by ossistructure, and excision on this surface distal to the bifurcation is indicated in order to avoid extensive excision on the distal surface and to allow a buccal application of the exolever to complete the extraction after the tooth has been directed distally and upward by the application of the exolever to the mesiobuccal surface, which procedure can be followed on account of the large interproximal space between the second and third molars.

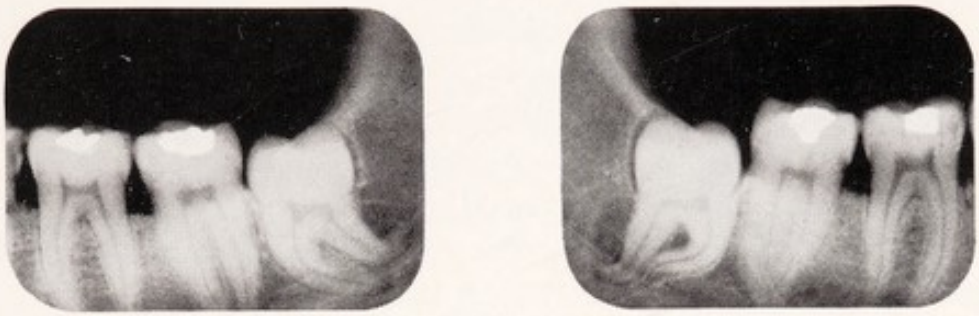


Fig. 445. — Vertical Impaction—Lingual Deflection—Mesial Surface Accessible. Both roots inclined distally. The ossistructure on distal surface extends over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

In Fig. 446 are shown two cases where the tooth is deflected lingually, with the mesial root inclined distally and the distal root straight, with the ossistructure extending over the distoclusal surface and on the entire distal surface. Excision of the ossistructure over the occlusal surface and on the distal surface is indicated, as the tooth can be directed out of its socket, by the application of the exolever to the mesiobuccal surface, to a point where a buccal application can be made to complete the extraction, without interference of the ossistructure on the buccal surface. Excision of the ossistructure on this surface is not indicated. A mesiobuccal application of the exolever should be made, as the mesial root of the third molar is in contact with the distal root of the second. Where this procedure cannot be followed without endangering the second molar on account of the deflection and the relation of the mesial surface of the third molar to the distal surface

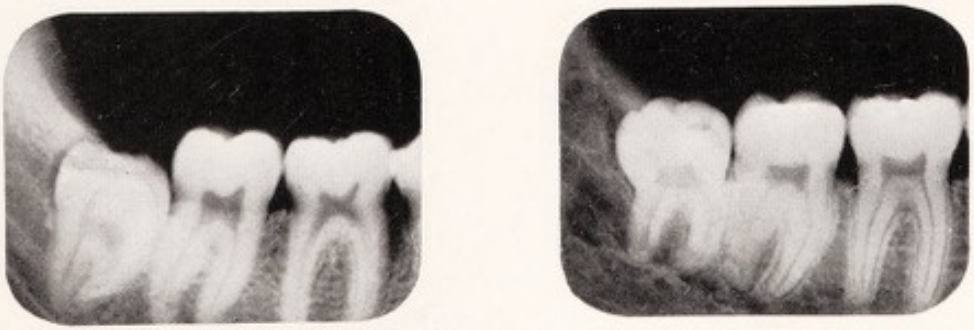


Fig. 446. — Vertical Impaction—Lingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight. The ossistructure on distal surface extends over distoclusal surface, entire distal surface and over greater part of lingual and buccal surfaces.

of the second, the extraction should be completed, after a buccal excision has been made, with a buccal application independent of any mesial application.

In Fig. 447 are shown two cases where the tooth is deflected lingually, with the mesial root inclined distally and the distal root straight, and with a bifurcation of the mesial root. The ossistructure on the distal surface extends up to the occlusal surface and is slightly involved by a pathologic condition. Extensive excision of the ossistructure on the distal surface is indicated, as there is a bifurcation of the mesial root, and considerable resistance will be presented during the application of the exolever to the mesial or mesiobuccal surface. In order to avoid a fracture of the roots, a buccal application is indicated after excision has been made on the buccal surface. When the exolever is adjusted to the mesial or mesiobuccal surface, sufficient pressure is applied to overcome the resistance of the root formation, and the extraction is completed by a buccal application.

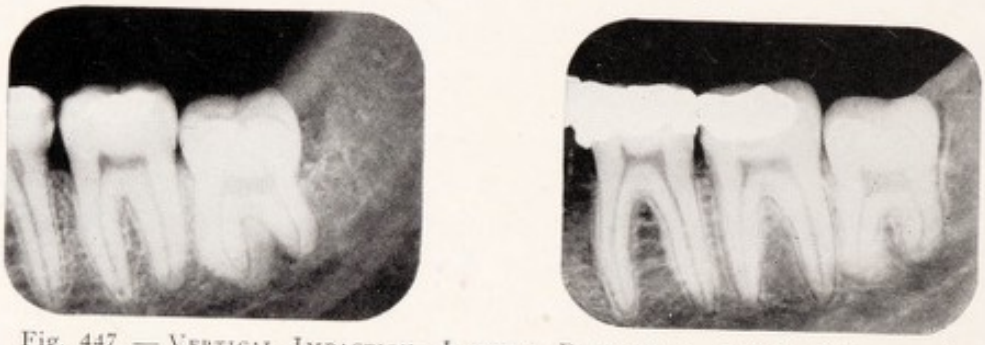


Fig. 447. — Vertical Impaction—Lingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with a bifurcation of mesial root. The ossistructure extends on distal surface up to occlusal surface and over greater part of lingual and buccal surfaces.

In the case shown in Fig. 448 A, where the tooth is deflected lingually, with the mesial root inclined distally and the distal root inclined mesially, with a septum between them, excision is indicated over the distoclusal surface and on the distal surface. When the exolever is adjusted to the mesiobuccal surface, the initial application is made with sufficient pressure to fracture the septum between the

Fig. 448. — Vertical Impaction—Lingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially. The ossistructure extends over distoclusal surface, on entire distal surface and over greater part of lingual and buccal surfaces.

roots, as it will be a resisting factor, and the extraction is completed by a buccal application. The buccal surface is free of ossistructure to such an extent that no excision will be necessary. After the excision has been made over the distoclusal surface and the septum is no larger than shown in the radiogram, ossisector No. 11L or 11R can be wedged between the buccal surface and the ossistructure to extract the tooth, and this will obviate a mesiobuccal application of the exolever and the distal excision. In Fig. 448 B is shown the case after extraction.

In Fig. 449 are shown two cases where the tooth is deflected lingually, with the mesial root inclined distally and the distal root inclined mesially, with the ossistructure extending over the distoclusal, the entire distal and the greater part of the lingual and buccal surfaces. Excision is indicated on the distal and over the distoclusal surfaces. Excision is made on the buccal surface distal to the bifurcation of the tooth before the exolever is adjusted to the buccal surface. Sufficient pressure is applied on making the initial exolever movements, when the exolever is adjusted to the mesial or mesiobuccal surface, to fracture the septum between the roots and direct the tooth distally and upward far enough to allow the extraction to be completed by a buccal application.

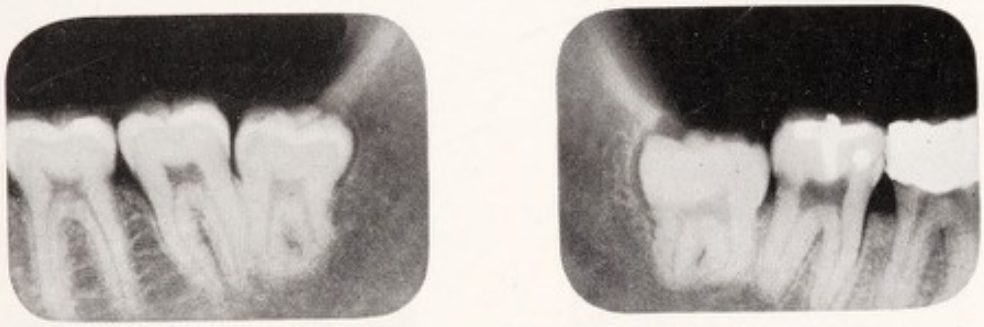


Fig. 449. — Vertical Impaction—Lingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially, with a small septum between them. The ossistructure extends over distoclusal surface, on entire distal surface and over greater part of lingual and buccal surfaces.

In Fig. 450 are shown two cases where the tooth is deflected lingually. The mesial root is inclined distally and the distal root is inclined mesially, being fused and hypercementosed, with a variation in the ossistructure on the distal surface. After the necessary excision of the ossistructure on the distal surface has been made, excision on the buccal surface is indicated. When the application of the exolever is made to the mesial or mesiobuccal surface, considerable resistance will be presented on account of the enlargement of the roots due to hypercementosis, and sufficient pressure is applied to loosen the tooth so as to allow the extraction to be completed by a buccal application. During the mesial or mesiobuccal application of the exolever,

care should be taken to direct the tooth distally with a limited degree of pressure in order to avoid a fracture of the crown, especially if insufficient excision on the distal surface has been made.

Fig. 450. — Vertical Impaction—Lingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially, with both roots affected by hypercementosis. The ossistructure on distal, lingual and buccal surfaces is varied.

In Fig. 451 are shown two cases where the tooth is deflected lingually, with the mesial root inclined distally and the distal root inclined mesially, and with the ossistructure on the distal surface extending up to the occlusal surface, which is excised down to the gingival third. The character of the root formation indicates that there will be considerable resistance, and the initial exolever movements to direct the tooth distally and upward are made with sufficient force to fracture the septum between the roots, when the extraction is completed by a buccal application.

Fig. 451. — Vertical Impaction—Lingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially. Roots are large, with large septum between them. The ossistructure on distal surface extends up to occlusal surface and over greater part of lingual and buccal surfaces.

In Fig. 452 are shown two cases where the tooth is deflected lingually and where there is a divergency in the root formation, with the ossistructure on the distal surface extending up to the occlusal surface. Excision of the ossistructure on the distal and buccal surfaces is indicated. When the exolever is applied to the mesial or mesiobuccal surface to direct the tooth to a slight extent distally, a fracture of one or both roots may occur, and the operator should be prepared to remove any remaining parts. The tooth is directed distally only far enough to loosen it, and the extraction is completed by a buccal application.

Fig. 452. — Vertical Impaction—Lingual Deflection—Mesial Surface Accessible. Divergency of roots, with ossistructure on distal surface extending up to occlusal surface and over part of lingual and buccal surfaces.

In Fig. 453 are shown two cases where the tooth is deflected lingually, with both roots straight, and with the ossistructure on the distal surface extending up to the occlusal surface. The application of the exolever to the mesial surface is made with only sufficient pressure to loosen the tooth, and the extraction is completed by a buccal application after the excision of the ossistructure on the distal surface and on the buccal surface at the bifurcation has been made.

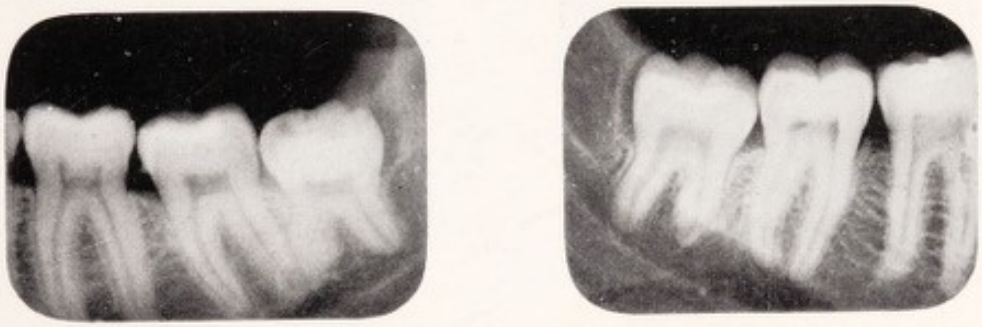


Fig. 453. — Vertical Impaction—Lingual Deflection—Mesial Surface Accessible. Both roots practically straight. The ossistructure on distal surface, which is slightly involved by pathologic condition, extends up to occlusal surface and over greater part of lingual and buccal surfaces.

In Fig. 454 are shown two cases where the tooth is deflected lingually, with the mesial root inclined distally and the distal root inclined mesially, and with a pathologic condition involving the ossistructure on the mesial, distal, lingual and buccal surfaces. Excision is indicated on the distoclusal surface and on the distolingual surface

Fig. 454. — Vertical Impaction—Lingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially, with pathologic condition involving ossistructure on mesial, distal, lingual and buccal surfaces.

(there being always a large ledge of ossistructure on the latter surface), followed by excision on the buccal surface slightly distal to the bifurcation to a point where a secure fulcrum can be obtained. Pathologic changes have involved the ossistructure on the buccal surface to such an extent that, unless excision is made at this point, a secure fulcrum cannot be obtained for a buccal application after the tooth has been directed distally and upward by the application of the exolever to the mesial or mesiobuccal surface.

In Fig. 455 are shown two radiograms where the tooth is deflected lingually, with quite a large space between the second and third molars, indicating that the use of the second molar as a fulcrum can be avoided. The ossistructure anterior to the mesial surface can be used as a fulcrum, and the exolever technic is executed as in the case of an isolated mandibular third molar where the mesial surface is accessible (page 455), use being made of the broad mesial surface of

A B

Fig. 455. — Vertical Impaction—Lingual Deflection—Mesial Surface Accessible. Large interproximal space between mesial surface of third molar and distal surface of second. *A*, pathologic involvement of septum at bifurcation of roots of second molar and interseptum between first and second molars; *B*, septum at bifurcation of roots of second molar and interseptum between first and second molars in approximately normal condition.

the third molar that is free from the distal surface of the second molar for the application of the exolever. Where access to the entire mesial surface with an exolever is not practicable, the exolever indicated for a mesiobuccal application is then used, and the tooth is directed distally and upward to a distance where a buccal application can be made to complete the extraction. Excision over the distoclusal surface and on the distal and buccal surfaces is indicated. In this type of case when excising the ossistructure on the distal surface the distance for access to the distal surface is greater, and ossisector No. 3L or 3R is indicated.

In Fig. 455 A the septum at the bifurcation of the second molar is involved by a pathologic condition, and it is questionable whether this tooth can be retained. In Fig. 455 B the septum of the second molar is not involved, and this tooth can be retained.

LINGUAL DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

Where the third molar is impacted in a vertical position, with the buccal surface of the crown deflected to a slight extent lingually out of alignment with the corresponding surface of the second molar and the mesial surface is inaccessible to the immediate application of the exolever, a type of case is presented that is not frequently seen in practice. Where the tooth is deflected in such a position, the condition is not usually shown by the clinical examination, and in such a case cannot be determined until a radiogram has been made.

CLINICAL EXAMINATION

Exposed Crown.—Rarely is any part of the crown exposed.

Gum Tissue.—The gum tissue usually covers the greater part of the crown, and occasionally there is a small break in the continuity of the tissue, from which pus may be discharged.

RADIOGRAPHIC INTERPRETATION

Crown.—A part of the occlusal surface is visible, but not so much of it is seen as in a linguoangular or complete lingual deflection, and there is no marked foreshortening of the roots such as is seen in the latter types. The lingual deflection of the third molar should be checked with the first and second molars, and it will be noted that these teeth show definite enamel caps and pulp chambers, but no part of the occlusal surface is visible. There is no overlap, at the contact point, of the first molar upon the second, and there is no overlap, at the contact point, of the mesial surface of the third molar upon the distal surface of the distal root of the second. The mesial surface of the third molar is at or below the gingival third of the second, and there is a variation in the size of the interseptum between the second and third molars.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root straight, 7; mesial root inclined distally and distal root inclined mesially, 2; partially developed roots, 1, and both roots inclined distally, 2.

Ossistructure.—The ossistructure usually surrounds the greater part of the tooth, and, if any part is free of ossistructure, it will be the mesial third of the occlusal surface. There may be a large interseptum between the second and third molars, which can be utilized as a fulcrum.

OPERATIVE TECHNIC

Gum Tissue Technic.—The entire tooth is usually covered by gum tissue. An incision is made along the entire distal surface of the second molar in order that the tissue at this point may not be subjected to trauma. The incision should extend downward and buccally beyond the distobuccal surface of the second molar, so that the ossistructure on the mesiobuccal surface of the third molar may be excised and the application of the exolever be made to this surface. An incision is made distally along the buccal surface, extending to a point that will permit excision of the ossistructure over the distoclusal surface and on the distal and buccal surfaces (Fig. 456).

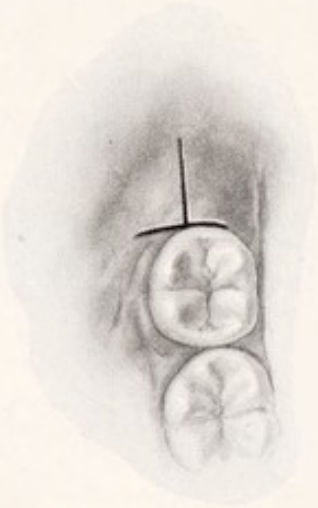


Fig. 456. — Incision of Gum Tissue—Vertical Impaction—Lingual Deflection—Mesial Surface Inaccessible. Incision made along distal surface downward and buccally beyond distobuccal surface of second molar and distally along buccal surface of third molar.

Ossistructure Technic—Occlusal Excision.—The ossistructure extends over the lingual fourth or half of the occlusal surface, and, if the operator fails to make this excision in advance of the exolever technic, increased resistance will follow when this procedure is attempted. The excision is made as described where there is a lingual deflection and the mesial surface is accessible (page 420).

Distal Excision.—The excision of the ossistructure on the distal surface is started with ossisector No. 5L or 5R, the blade being directed to a slight extent distally to the part to be excised. When the blade has penetrated the cortical plate, the excision is continued with ossisector No. 1L, 3L or No. 2R, 3R to a point on the distal surface down to the gingival third that will permit the tooth to be directed distally and upward, and is made as described on page 342.

Buccal Excision.—After the ossistructure over the lingual fourth or half of the occlusal surface and on the distal surface has been excised, excision is made on the buccal surface, when indicated, in order that the extraction can be completed by a buccal application of

the exolever, and the latter excision is made as described for a lingual deflection where the mesial surface is accessible (page 421). Where there is a lingual deflection of the third molar, the ossistructure on the buccal surface is often not so dense as where the tooth is deflected buccally or where there is no deflection. Starting the excision at the superior border of the ossistructure, it is continued down to a point where an exolever can be adjusted at the bifurcation after the tooth has been partially directed distally and upward by the

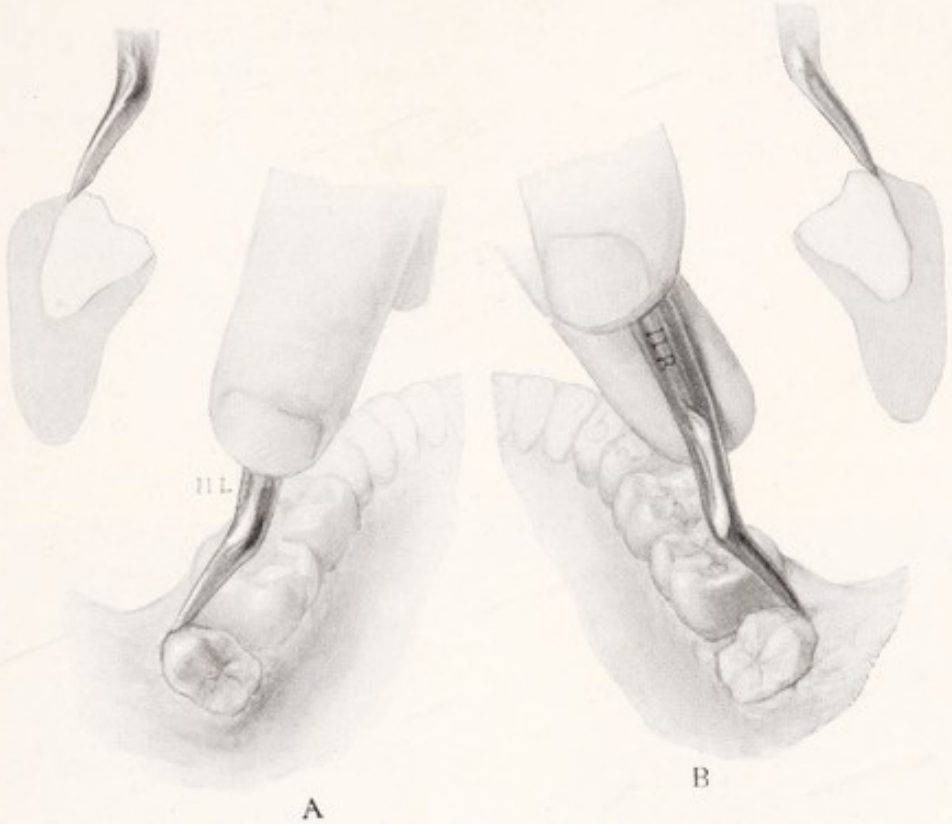


Fig. 457. — Buccal Excision of Ossistructure—Vertical Impaction—Lingual Deflection—Mesial Surface Inaccessible. *A*, application of ossisector No. 11L to be wedged between buccal surface and ossistructure on left side; *B*, application of blade to be wedged between buccal surface and ossistructure on right side.

application of the exolever to the mesial surface. Where the roots are not divergent or there is not a large septum between them the ossisector blade, when wedged between the buccal surface and the ossistructure on this surface, is often sufficient to loosen the tooth or extract it. Especially can this procedure be followed where there is a lingual deflection and the mesial surface is accessible. In Fig. 457 A is shown the blade of ossisector No. 11L applied on the left side to be wedged between the buccal surface and the ossistructure; in Fig. 457 B is shown the blade applied to be wedged between the buccal surface and the ossistructure on the right side.

Mesiobuccal Excision.—In addition to the excision of the ossistructure over the lingual fourth or half of the occlusal surface and on the distal and buccal surfaces, excision to gain access with the

exolever to the mesiobuccal surface is indicated. Ossisector No. 7L or 8L for the left side or No. 7R or 8R for the right side is selected, the gum tissue over the mesiobuccal surface being displaced with the back of the blade, and the blade directed toward the mesiobuccal surface (Fig. 458). The excision is made between the mesiobuccal surface of the third molar and the ossistructure on this surface for the purpose of creating a space at this point, and only sufficient excision is necessary to allow the application of the exolever blade to the mesiobuccal surface. When making the excision, care should be taken not to injure the distal root of the second molar. The distance between the buccal surface of the third molar and the corresponding surface of the second is determined before the ossisector is applied to the mesiobuccal surface of the third molar.

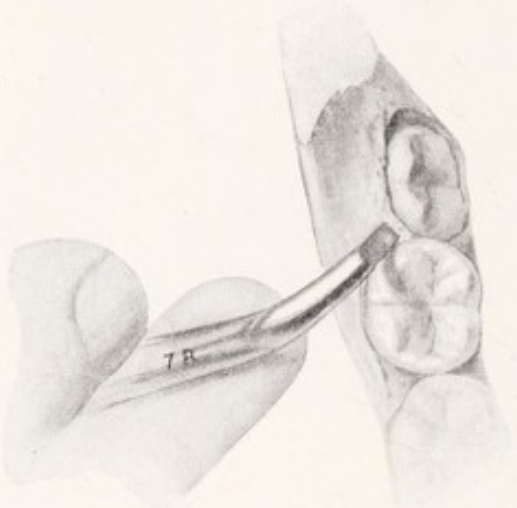


Fig. 458. — Mesiobuccal Excision of Ossistructure—Vertical Impaction—Lingual Deflection—Mesial Surface Inaccessible. Ossisector No. 7R applied for excision on mesiobuccal surface.

Exolever Technic—Mesiobuccal and Buccal Applications.—No attempt should be made to apply the exolever until the operator is certain that the ossistructure over the occlusal surface and on the mesiobuccal, distal and buccal surfaces has been excised sufficiently to permit access to the mesiobuccal and buccal surfaces, and that the points of resistance when the exolever movements are made will offer no interference.

Where the mesial surface of the third molar is in close contact with the distal surface of the second, exolever No. 9L for the left side or No. 9R for the right side is selected. The gum tissue on the buccal surface is displaced with the back of the blade, and the blade is directed downward on the mesiobuccal surface, being wedged, with pressure under control, between the mesiobuccal surface of the third molar and the ossistructure, when the tooth is directed distally and upward in conformity with the root formation, as described for a mesiobuccal application (page 368).

When the tooth has been loosened by the application of the exolever to the mesiobuccal surface, the extraction is completed by a buccal application, exolever No. 10L for the left side or No. 10R for the right side being used, and the technic is the same as in the case of a buccal application described on page 361. Where there is a large space between the second and third molars, exolever No. 11L, 12L for the left side or No. 11R, 12R for the right side is adjusted to the mesial surface, the ossistructure anterior to the mesial surface being used as a fulcrum, and the technic is the same as in a case of an isolated mandibular third molar where the mesial surface is inaccessible (page 455).

SUMMARY OF CASES

In Fig. 459 A is shown a radiogram of a case where the tooth is deflected to a slight extent lingually, with both roots inclined distally, and with the ossistructure extending over the greater part of the tooth. Excision of the ossistructure over the lingual half of the distoclusal surface, and on the mesiobuccal, distal and buccal surfaces is indicated. As there is quite a space between the second and third molars, the excision on the mesiobuccal surface will not

A B

Fig. 459. — Vertical Impaction—Lingual Deflection—Mesial Surface Inaccessible. *A*, both roots inclined distally, with ossistructure extending over greater part of tooth; *B*, mesial root inclined distally and distal root straight, with ossistructure extending over greater part of tooth.

be difficult and the distal surface of the distal root of the second molar will not be disturbed. When directing the tooth distally and upward in conformity with the root formation, the ossistructure anterior to the mesiobuccal surface is used as a fulcrum. No attempt should be made to direct the tooth completely out of its socket by the mesiobuccal application of the exolever, as too extensive an excision on the distal surface will be required. The extraction is completed by a buccal application.

In Fig. 459 B is shown a case where the tooth is deflected lingually, with the mesial root inclined distally and the distal root straight. The technic described for Fig. 459 A is indicated. If it is observed that the broad mesial surface can be utilized for the application of

exolever No. 11L, 12L for the left side or No. 11R, 12R for the right side, this instrument is used, and the exolever technic for an isolated mandibular third molar where a mesial application is to be made is indicated (page 455).

In Fig. 460 are shown two cases where the tooth is deflected lingually, with the mesial root inclined distally and the distal root straight, and with the ossistructure extending over the greater part of the tooth. The case is treated as described for Fig. 459 A, the operator keeping in mind the location of the bifurcation of the roots when making the buccal excision and buccal application of the exolever.

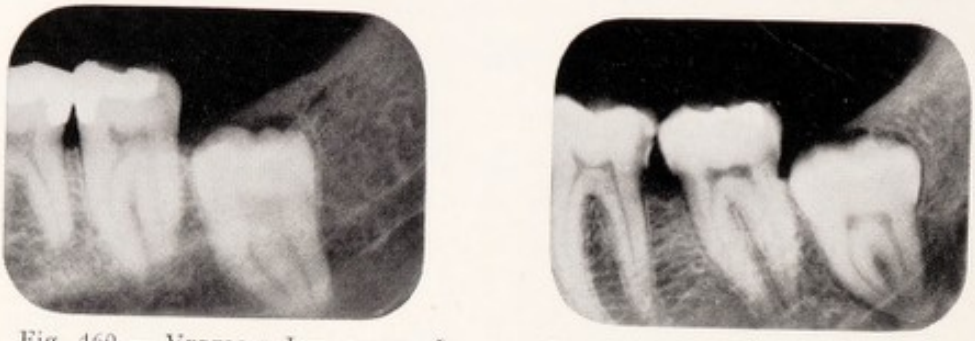


Fig. 460. — Vertical Impaction—Lingual Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root straight, with ossistructure extending over greater part of tooth.

In Fig. 461 is shown a case where the tooth is deflected lingually, with the mesial root inclined distally and the distal root straight, and there is an enlargement of the roots due to hypercementosis. Excision on the distal surface is indicated to permit the tooth to be directed to a slight extent distally. Excision is made to gain access to the mesiobuccal surface, and the ossistructure on the buccal surface is excised to a point where the bifurcation can be reached with the exolever when it is adjusted to this surface, but the excision should not be so extensive as to destroy a good fulcrum, as the roots are of an unusual size and will offer a great deal of resistance. Excision on the lingual fourth of the occlusal surface is also indicated.

The interseptum between the first and second molars is slightly

Fig. 461. — Vertical Impaction—Lingual Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root straight. Both roots hypercementosed, with ossistructure over lingual fourth of occlusal surface, on distal surface extending up to occlusal surface and over entire mesial, lingual and buccal surfaces.

involved, and the operator should be careful not to endanger the second molar when the exolever movements are being executed, as considerable resistance will be presented when the exolever movements are applied to the mesiobuccal and buccal surfaces. The root formation will not permit the tooth to be directed very far distally, and too great pressure should not be exerted, as a fracture at the gingival third will follow, dependence being placed on a buccal application to complete the extraction.

BUCCOLINGUAL DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

A case is rarely seen where the third molar is impacted in a vertical position, with the buccal surface of the crown out of alignment buccally with the corresponding surface of the second molar, and with the occlusal surface deflected to a slight extent lingually, the mesial surface being accessible to the immediate application of the exolever. This type of case is considered the most complicated of the vertical types of impaction where the mesial surface is accessible. If the radiogram has not been correctly made, the tooth will appear as if it were in a "freak" position; but, if it has been correctly made, the position will be easily recognized. More failures in the execution of the forceps or exolever technic will occur in this type of case than in any other types of vertical impaction. Where a forceps technic is followed, a fracture of the crown is liable to occur on account of the inability of the operator to grasp securely the crown on the lingual and buccal surfaces with the beaks of the instrument, or a fracture may occur when an attempt is made to force the beaks over the lingual and buccal surfaces, as the ossistructure usually extends over the greater part of these surfaces. Where an exolever technic is executed, failure will result if the ossistructure on the linguoclusal, distoclusal and distal surfaces has not been excised and it has not been observed that a part of the mesiobuccal surface of the third molar is in contact with the distobuccal surface of the second. Rarely is a case of this type seen where a pathologic condition has not slightly involved the ossistructure on the distal surface. Where the ossistructure on the mesial and distal surfaces is involved by pathologic changes, the structure on the buccal surface will also be involved, and a suitable fulcrum cannot be obtained on the buccal surface at the bifurcation unless the ossistructure on this surface has been excised in advance of the application of the exolever. Every step in the operative procedure should be made with caution, for, if any part of the procedure is not executed as described, a fracture of the crown or roots, accompanied by extensive trauma, will result.

CLINICAL EXAMINATION

Exposed Crown.—The mesioclusal surface is usually exposed, and, where possible, the alignment of the occlusal surface of the third molar is compared with the corresponding surface of the second and an estimate should be made of the extent of the contact of the third molar with the second.

Gum Tissue.—The gum tissue usually covers the greater part of the crown, except the mesioclusal surface.

RADIOGRAPHIC INTERPRETATION

Crown.—There is an overlap, at the contact point, of the third molar upon the second, but there is no overlap, at the contact point, of the first molar upon the second, indicating a buccal deflection. A part of the occlusal surface of the third molar is visible, and the enamel caps and pulp chambers of the first and second molars are definitely shown, but no part of the occlusal surfaces of the latter two teeth is visible, verifying a lingual deflection of the third molar. The two deflections form what is considered a buccolingual deflection.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: divergent roots, 7; both roots straight, 3; both roots inclined distally, 3; mesial root inclined distally and distal root straight, 3; mesial root inclined distally and distal root inclined mesially, 3; fused roots, 3, and partially developed roots, 2.

Ossistructure.—The mesial surface is free of ossistructure, and there is a variation in the extent of surface that may be available for the application of the exolever without excision, but in all cases the ossistructure extends over the distoclusal surface and on the distal surface. Where the distoclusal surface is free of ossistructure, the condition is usually the result of pathologic changes. There is, as a rule, a small space between the distal surface and the ossistructure on this surface due to pathologic involvement. The ossistructure usually extends on the greater part of the buccal surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—As the gum tissue usually covers the greater part of the crown, an incision is made slightly along the mesiobuccal surface, the lancet being inserted at that part of the crown in contact with the distobuccal surface of the second molar. The point of the lancet is used to determine the location of the mesiobuccal surface, and a slight incision is also made along that surface, extending down-

ward and buccally. The latter incision, which will show the location of the buccal surface, is continued, following the buccal surface distally to a point that will permit excision of the ossistructure on the distal and buccal surfaces and allow a buccal application of the exolever to complete the extraction (Fig. 462 A). Where only a mesiobuccal application is indicated, incision is then made distally over the center of the occlusal surface (Fig. 462 B). Incision is also indicated along the distobuccal surface of the second molar where the tissue at this point is liable to be injured.

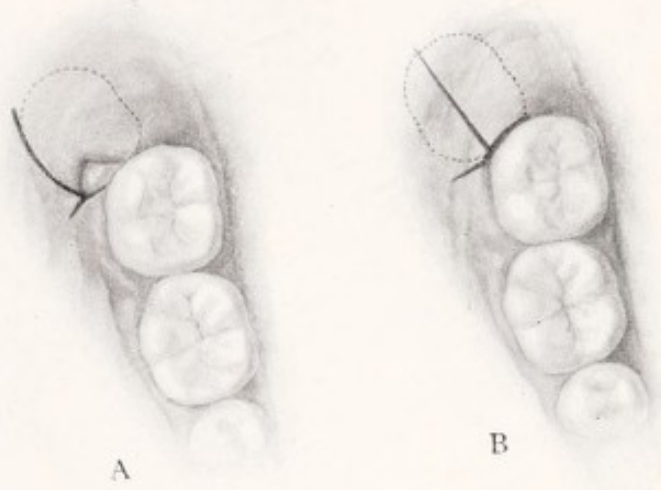


Fig. 462. — Incision of Gum Tissue—Vertical Impaction—Buccolingual Deflection. *A*, incision downward and buccally on mesiobuccal surface, distally along buccal surface; *B*, incision downward and buccally on mesiobuccal surface, distally along center of occlusal surface and on distobuccal surface of second molar.

Ossistructure Technic—Occlusal Excision.—The first excision is made over the distoclusal surface, ossisector No. 1L, 1R; No. 3L, 3R; or No. 5L, 5R being used. The gum tissue over the distoclusal surface is displaced with the back of the blade, and all the ossistructure over this surface is excised as described on page 347. The ossistructure extending over the mesiolingual fourth of the occlusal surface should also be included in this excision, and the excision should be executed with ossisector No. 11L for the left side or No. 11R for the right side. The blade is applied over the occlusal surface of the third molar and along the distal surface of the second, and is directed between the occlusal surface and the superior border of the ossistructure (Fig. 463 A) and pressure is applied to fracture or excise the structure, the instrument being kept under control so as not to injure the gum tissue.

Distal Excision.—The excision of the ossistructure on the distoclusal surface has prepared a way for excising on the distal surface, and, where the ossistructure on this surface is involved by a pathologic condition to some extent, excision will not be difficult. Ossisector No. 1L, 3L or 5L for the left side or No. 1R, 3R or 5R for the right side

is selected, and the excision is made down to the gingival third, a space thus being created on the distal surface permitting the tooth to be directed distally in conformity with the root formation as described on page 342. This excision is not so readily made as in the case where the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second, as the operator is always confronted with the internal and external oblique ridges.

Buccal Excision.—Excision on the buccal surface is indicated where the exolever cannot be adjusted to this surface at the bifurcation after the tooth has been directed distally and upward by the application of

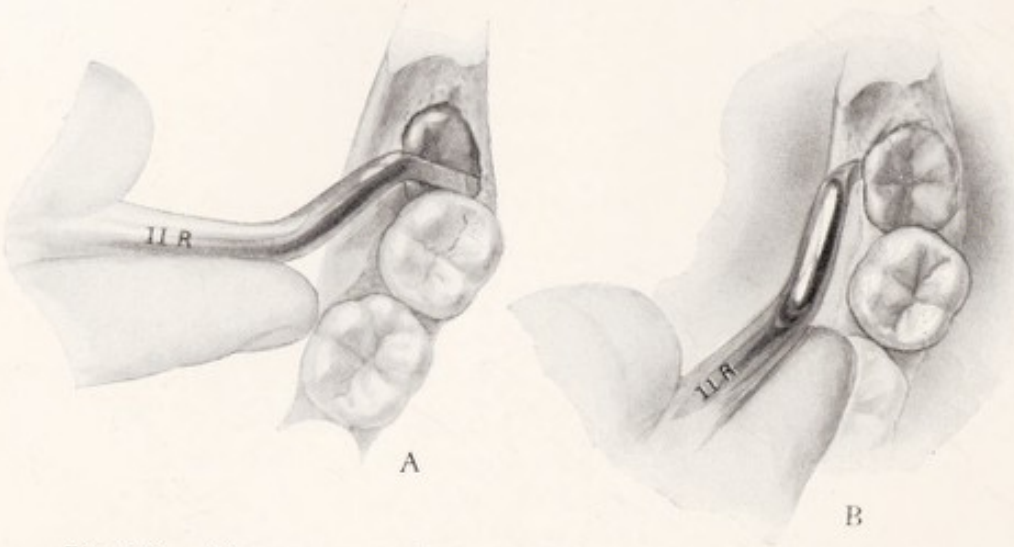


Fig. 463. — Occlusal and Buccal Excisions of Ossistructure—Vertical Impaction—Buccolingual Deflection. *A*, ossisector No. 11R applied when excising over mesiolingual fourth of occlusal surface; *B*, ossisector No. 11R applied on buccal surface distal to bifurcation.

the exolever to the mesiobuccal surface. When excision on the buccal surface is indicated, it is made toward this surface with ossisector No. 11L for the left side or No. 11R for the right side, the operator starting at the occlusal surface and excising down to a point slightly above the bifurcation, confining the excision to the area at or distal to the bifurcation (Fig. 463 B). When this excision is being made, the blade can often be wedged between the buccal surface and the ossistructure on this surface. If a large space is available, often no excision is necessary, and the blade of the ossisector, when wedged between the buccal surface and the ossistructure on this surface, will have a tendency to raise the tooth out of its socket.

Where the ossistructure on the buccal surface is involved by a pathologic condition, there will be difficulty in securing a suitable fulcrum, and excision is indicated down to a point where a secure fulcrum can be obtained.

Exolever Technic—Mesiobuccal and Mesial Applications.—The exolever is adjusted to that part of the mesiobuccal or mesial surface of

the third molar which is accessible and is deflected buccally out of alignment with the distobuccal surface of the second molar. In this type of impaction the mesiobuccal or mesial surface of the third molar, in its relation to the distobuccal surface of the second molar, is different from the deflection in the case where the tooth is deflected buc-

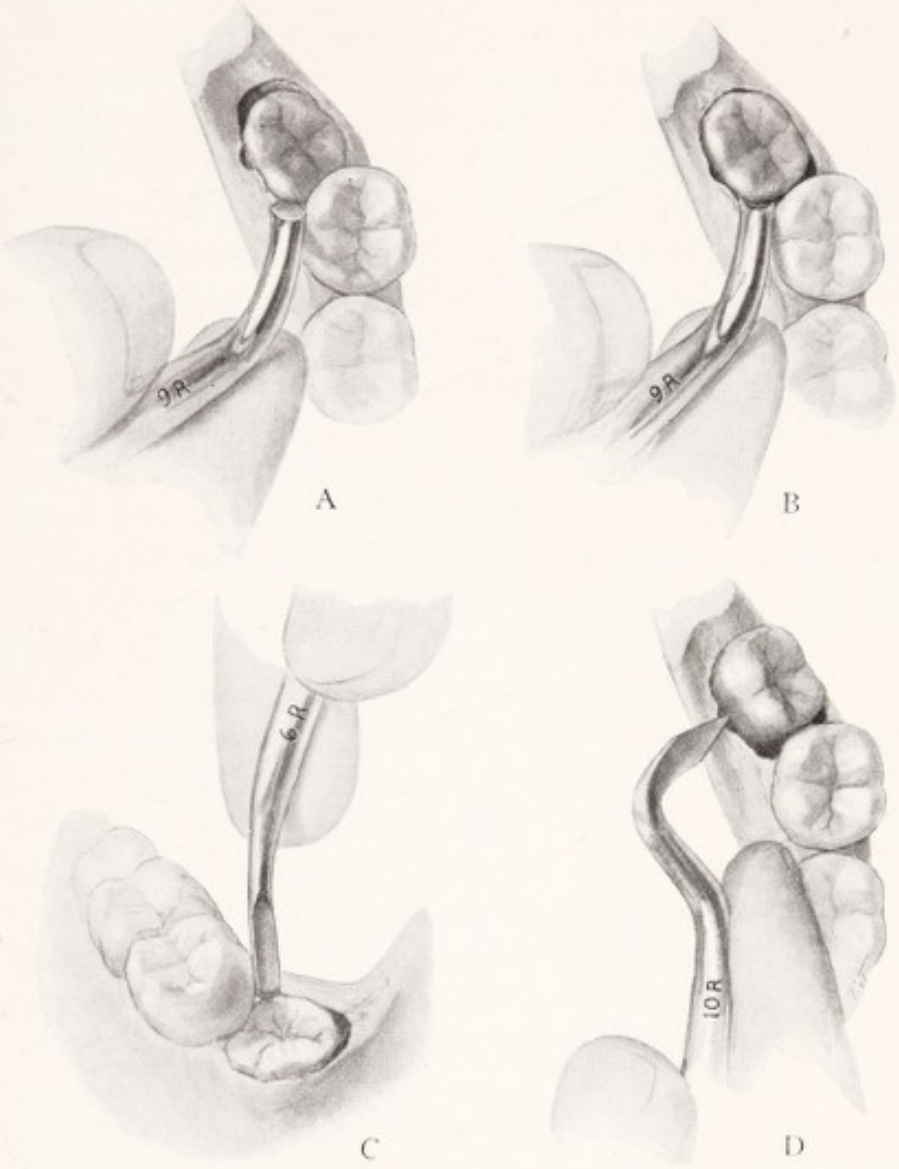


Fig. 464. — Mesiobuccal and Buccal Applications of Exolever—Vertical Impaction—Buccolingual Deflection. *A*, exolever No. 9R applied to mesiobuccal surface where an excision has been made on distal surface, and on buccal surface distal to bifurcation; *B*, blade of instrument wedged between mesiobuccal surface and ossistructure, tooth directed distally and upward; *C*, ossisector No. 6R applied as a pathfinder to mesiobuccal surface where a distal excision has been made; *D*, exolever No. 10R applied on buccal surface at bifurcation after mesiobuccal surface has cleared distobuccal surface of second molar, and tooth is directed upward by turning handle buccally.

cally. Where the third molar is deflected buccolingually, part of the mesiobuccal surface is in close contact with the distobuccal surface of the second molar, and it is often difficult to apply the exolever between these two surfaces or between the mesiobuccal surface of the third molar and the superior border of the ossistructure. If, however, the

third molar is deflected buccally, the mesial surface is not in contact with the distobuccal surface of the second, and there is no difficulty in adjusting the exolever to that part of the mesial surface of the crown of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second. Exolever No. 9L for the left side or No. 9R for the right side is selected, and the blade is directed toward that part of the mesiobuccal surface of the third molar which is in contact with the distobuccal surface of the second (Fig. 464 A). Considerable pressure is applied, and the blade is sent down on the mesiobuccal surface (Fig. 464 B). Where the roots are short and favorable for a mesiobuccal application, the wedge created is often sufficient to extract the tooth. If the tooth is not extracted with the blade in this position, the handle of the instrument is directed mesially or distally, and this will have the effect of directing the tooth distally and upward. If by this procedure the tooth is loosened to such an extent that it is directed quite a distance distally and upward without a great deal of resistance being presented, the exolever movements are repeated where the root formation makes such a course necessary. Where the application of the exolever to the mesiobuccal surface is limited by the condition of this surface and the septum between the roots presents considerable resistance, the tooth is directed distally to a point where no part of the third molar is in contact with the distobuccal surface of the second and where there is sufficient space between the second and third molars to adjust exolever No. 2L or 2R. The point of the blade is inserted between the second and third molars, the tooth being directed as far distally as may be indicated by the character of the root formation and septum. The latter procedure should not be followed where the roots of the second molar are fused, and is indicated only where there is a large septum between the roots of the third molar or where the roots are inclined to a marked extent distally.

Where the mesial surface of the mesial root of the third molar is in contact with the distal surface of the distal root of the second, no attempt should be made to utilize the second molar as a fulcrum, as such a procedure will loosen the second molar and force the roots of this tooth against the roots of the third molar. The extraction technic should be executed independently of the use of the second molar as a fulcrum, dependence being placed on the adjustment of exolever No. 9L for the left side or No. 9R for the right side to loosen the third molar and direct it to a slight extent distally so that it is not in contact with the distobuccal surface of the second molar. When the exolever is adjusted to that part of the mesiobuccal surface of the third molar that is deflected buccally out of alignment with the distobuccal surface

of the second, considerable pressure is exerted downward to create a wedge between the mesiobuccal surface of the third molar and the ossistructure anterior to this surface to loosen the tooth, the operator repeating this procedure as may be necessary, each time sending the blade farther down between the mesiobuccal surface and the ossistructure. In a case of this character dependence should be placed largely on the buccal application, after the tooth has been loosened, to complete the extraction, the tooth being directed to a slight extent distally in order that it will not again come in contact with the distobuccal surface. The contact of part of the mesiobuccal surface of the third molar with the distobuccal surface of the second is varied in its location. Where the contact is at the gingival third of the second molar and there is no pathologic involvement of the ossistructure on the mesiobuccal surface, ossisector No. 6L for the left side or No. 6R for the right side is used as a pathfinder to determine the access to the mesiobuccal surface. The wedge created by the application of this instrument (Fig. 464 C) between the mesiobuccal surface and the ossistructure, the blade being directed downward on the mesiobuccal surface where the roots are not markedly divergent or there is not a large septum between them, is often sufficient to extract the tooth.

Buccal Application.—When the tooth has been directed distally and upward out of its socket to a point where the exolever can be adjusted to the buccal surface at the bifurcation, the superior border of the ossistructure being utilized as a fulcrum, exolever No. 10L for the left side or No. 10R for the right side is selected. The gum tissue over the buccal surface is displaced with the back of the blade, and the blade, directed toward the bifurcation with considerable force, is wedged between the buccal surface and the ossistructure on this surface to loosen the tooth. When this adjustment has been made and the tooth has not been extracted by the wedge movement, the handle of the exolever is pressed downward and turned to a slight extent buccally (Fig. 464 D), care being taken that the tooth is not forced back to its original position and that no part of its surface comes in contact with the distobuccal surface of the second molar. If it is observed that the tooth has assumed its original position, the operator withdraws the exolever adjusted to the buccal surface and applies the instrument to the mesiobuccal surface, again directing the tooth distally from its contact with the distobuccal surface of the second molar. The buccal application is then repeated, care being taken that the mesiobuccal surface of the third molar does not come in contact with the distobuccal surface of the second. When the tooth is being directed out of its socket with the exolever, a slight lingual movement will materially assist in the extraction.

SUMMARY OF CASES

In the cases shown in Fig. 465 both roots are inclined distally, and no dependence can be placed on the mesiobuccal application of the exolever to direct the tooth distally and upward out of its socket in conformity with the root formation, as such a course will necessitate extensive excision on the distal surface, which can be partially decreased by completing the extraction by a buccal application. The ossistructure extending over the distoclusal surface is excised in advance of the ossistructure on the distal surface, and no excision will be necessary on the mesial surface for access to this surface. In order to adjust the exolever to the buccal surface, excision distal to the bifurcation is indicated. The tooth is directed distally and upward as far as possible, the distance being governed by the excision on the distal surface, and the extraction is completed by a buccal application. The ossistructure extends over the mesiolingual fourth of the occlusal surface and is excised in advance of the application of the exolever technic.

Fig. 465. — Vertical Impaction—Buccolingual Deflection—Mesial Surface Accessible. Both roots inclined distally, with ossistructure extending over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

As the mesial root of the third molar is in contact with the distal root of the second, the third molar should not be directed distally with too great a force, as there is a liability of loosening the second molar, and the exolever is applied with considerable pressure downward to loosen the tooth and to direct it to a slight extent distally, dependence

Fig. 466. — Vertical Impaction—Buccolingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with ossistructure extending over entire distal surface and part of lingual and buccal surfaces.

being largely placed on the buccal application to complete the extraction.

In the case shown in Fig. 466 the mesial root is inclined distally and the distal root is straight, and there is a large interseptum between the second and third molars. Excision is indicated on the distal surface. No excision is, however, indicated on the buccal surface, as the tooth can be directed distally and upward, by the application of the exolever to the mesiobuccal surface, to a point where a buccal application can be made without interference of the ossistructure on the buccal surface.

In the cases shown in Fig. 467 the ossistructure over the distoclusal surface is not extensive, and is excised in advance of the ossistructure on the distal surface. The roots are fused and not of a large size, the mesial root being inclined distally and the distal root being straight. By applying the exolever to the mesiobuccal surface, the tooth is directed distally and upward out of its socket, or is raised to a point where a buccal application can be made without the interference of the superior border of the ossistructure.

Fig. 467. — Vertical Impaction—Buccolingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with roots fused. The ossistructure extends over distoclusal surface, entire distal surface and part of lingual and buccal surfaces.

In the cases shown in Fig. 468 the mesial root is inclined distally and the distal root is straight, with the mesial surface of the mesial root of the third molar in contact with the distal surface of the distal root of the second, and, if proper care is not exercised, there will be a liability of loosening the second molar if this tooth is used as a fulcrum.

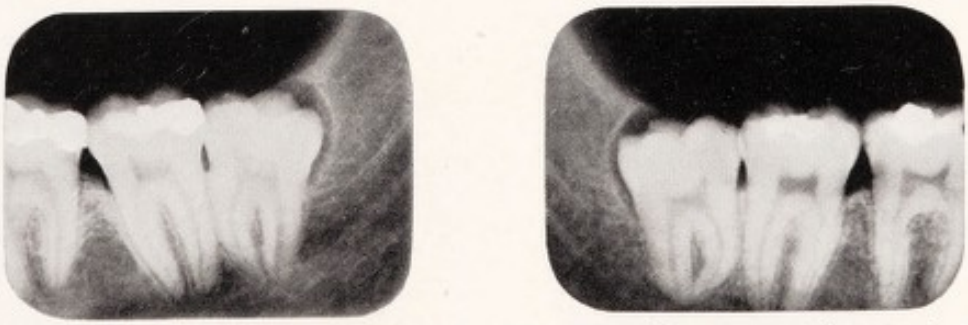


Fig. 468. — Vertical Impaction—Buccolingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight. The ossistructure extends over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

The third molar is loosened and directed distally from its contact with the second molar by the application of the exolever with considerable pressure to the mesiobuccal surface of the third molar, and a buccal application is made after the necessary excision of the ossistructure over the distoclusal surface and on the distal and buccal surfaces.

In the cases shown in Fig. 469 unusual resistance will be presented on account of the bifurcation of the roots and the septum between them. Excision on the distal surface and a slight excision on the buccal surface distal to the bifurcation is indicated. When the exolever is adjusted to the mesiobuccal surface in order to direct the tooth distally into the space created by the excision of the ossistructure on the distal surface, sufficient force is applied to fracture the septum, and the extraction is completed by a buccal application.

Fig. 469. — Vertical Impaction—Buccolingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with large septum between them. The ossistructure extends over entire distal surface and greater part of lingual and buccal surfaces.

In the cases shown in Fig. 470 the ossistructure over the distoclusal surface and on the distal and buccal surfaces is excised. The exolever is adjusted to the mesiobuccal surface, and the tooth is directed distally to loosen it slightly, not so far as to cause a fracture of the roots, but far enough to clear the distobuccal surface of the second molar, when the extraction is completed by a buccal application.

In the cases shown in Fig. 471 a pathologic condition has involved the ossistructure on the distal, lingual and buccal surfaces. Excision on the distolingual surface is indicated in order that no ledge of ossi-

Fig. 470. — Vertical Impaction—Buccolingual Deflection—Mesial Surface Accessible. Roots straight, with ossistructure extending over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

structure may remain to cause resistance in the execution of the exolever technic. Excision on the buccal surface is also indicated, although it appears that the superior border of the ossistructure will not interfere with the application of the exolever. There is often a large space between the buccal surface and the ossistructure on this surface which will permit an ossisector or exolever to be inserted into this space, but no suitable fulcrum will be obtainable, and exci-

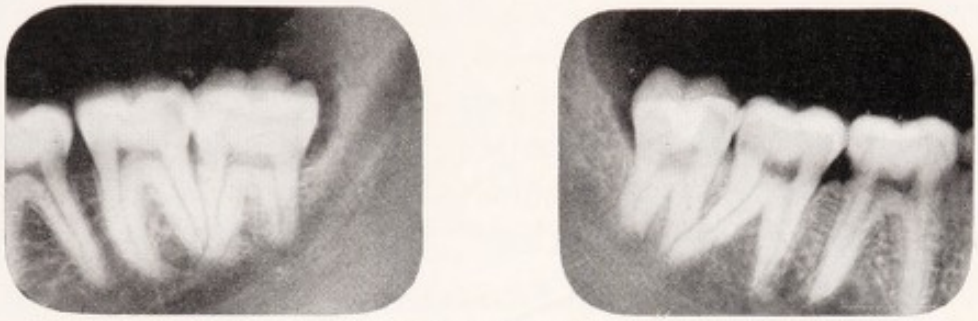


Fig. 471. — Vertical Impaction—Buccolingual Deflection—Mesial Surface Accessible. Ossistructure on distal, lingual and buccal surfaces involved by a pathologic condition.

sion on the buccal surface is, therefore, indicated to a point where a secure fulcrum can be obtained. During the application of the exolever to the mesiobuccal surface in order to direct the tooth distally, the pressure to be applied is governed by the size of the septum between the roots, and the extraction is completed by a buccal application. A fracture of one or both roots may occur if the operator attempts a forcible procedure with the exolever, or the tooth may return to its original position.

A

B

C

Fig. 472. — Vertical Impaction—Buccolingual Deflection—Mesial Surface Accessible. Same case. *A*, lingual radiogram; *B*, occlusal radiogram; *C*, radiogram made after extraction.

In Fig. 472 are shown three radiograms of the same case. In Fig. 472 A is shown a lingual radiogram; in Fig. 472 B is shown an occlusal radiogram, and in Fig. 472 C is shown the radiogram made after extraction. The contact of the third molar is at the gingival third of the second, and, in this type of case where the space between the two teeth does not permit exolever No. 9L or 9R to be adjusted, the blade of ossisector No. 6L or 6R is suitable to be applied initially to direct the tooth distally from its contact with the distobuccal surface of the second molar after the necessary excision has been made on the distal surface. The ossistructure extends in this type of case over the mesiolingual fourth of the occlusal surface and is excised in advance of the application of the exolever technic.

BUCCOLINGUAL DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

A case where the third molar is impacted in a vertical position, with a buccolingual deflection, and where the mesial surface is inaccessible to the immediate application of the exolever is rarely seen in practice. The technic for the extraction of an impacted tooth of this character does not differ from a case of buccolingual deflection where the mesial surface is accessible, except that excision for access to the deflected mesiobuccal surface is made in advance of the application of the exolever to this surface.

TORSIONAL DEFLECTION, WITH THE SURFACE THAT WOULD NORMALLY BE THE MESIAL SURFACE ACCESSIBLE

Where the third molar is impacted in a vertical position, with a torsional deflection, a type of case is presented that is not frequently seen, and such a deflection is unfavorable for an exolever or forceps technic. If a forceps technic is attempted, the beaks cannot be securely adjusted to the surfaces that would normally be the lingual and buccal on account of the deflection of the tooth and the bifurcation, which may be mesial or distal to its usual location. If an exolever technic is to be undertaken and the instrument is to be applied to the surface that would normally be the mesial surface, no definition can be obtained from a radiogram of the character of the root formation and septum, nor can an estimate be made of the degree of resistance that may be presented when the tooth is being directed distally. The lack of definition of the bifurcation will complicate a buccal application of the exolever.

CLINICAL EXAMINATION

Exposed Crown.—The surface that would normally be the mesioclusal surface is usually exposed, and the bifurcation is located, if possible, with an exploring instrument. The location of the bifurcation varies from a point distal to its normal position to a point that would normally be the center of the distal surface. When making the exploration, the buccal groove will be an important diagnostic point, and, if this groove can be determined, it will serve as a guide to the bifurcation.

Gum Tissue.—The gum tissue usually covers the greater part of the crown, except that part which would normally be the mesioclusal surface.

RADIOGRAPHIC INTERPRETATION

Crown.—The occlusal surface has an entirely different appearance from a case of impaction where the third molar is not deflected torsionally and the normal position of the cusps is changed. The pulp chamber of the third molar is usually indistinct compared with the pulp chambers of the first and second molars, and generally has the appearance of a small spot.

Roots.—As a rule, no definition of the root formation can be obtained from the radiogram on account of the torsional deflection of the tooth, and the roots will often have the appearance of being fused.

Ossistructure.—The surface that would normally be the mesial is free of ossistructure and is accessible to the immediate application of the exolever. In many of these cases the ossistructure on the surface that would normally be the distal is involved by pathologic changes. The location of the ossistructure on the surface that would normally be the buccal varies from the gingival third up to the occlusal surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—The surface that would normally be the mesioclusal is exposed, and some definition of the position of the tooth can be obtained. In order to gain access to the surface that would normally be the mesial surface, an incision of the gum tissue is made as in a case where there is no deflection (page 340). Where the tooth is deflected buccally, the incision is made as in a case of buccal deflection where the mesial surface is accessible (page 398). Where the tooth is deflected lingually, the incision is made as in a case of lingual deflection where the mesial surface is accessible (page 418). Where the tooth is deflected buccolingually, the incision is made as in a case of buccolingual deflection where the mesial surface is accessible (page 438). A second incision is made distally along the surface that would

normally be the buccal surface, extending to a point that will permit excision of the ossistructure, when indicated, on the surface that would normally be the distal and allow the application of the exolever on the buccal surface at the bifurcation.

Ossistructure Technic.—Where sufficient surface is available for the application of the exolever on the surface that would normally be the mesial, no excision is necessary. Where the ossistructure extends beyond the gingival third, and there is insufficient space to permit the tooth to be directed distally, excision is indicated on the surface that would normally be the distal, and is made as in a case where there is no deflection and the mesial surface is accessible (page 342). Where the ossistructure interferes with the application of the exolever to the surface that would normally be the buccal, excision is indicated on this surface, and is made as in a case where there is no deflection and the mesial surface is accessible (page 350).

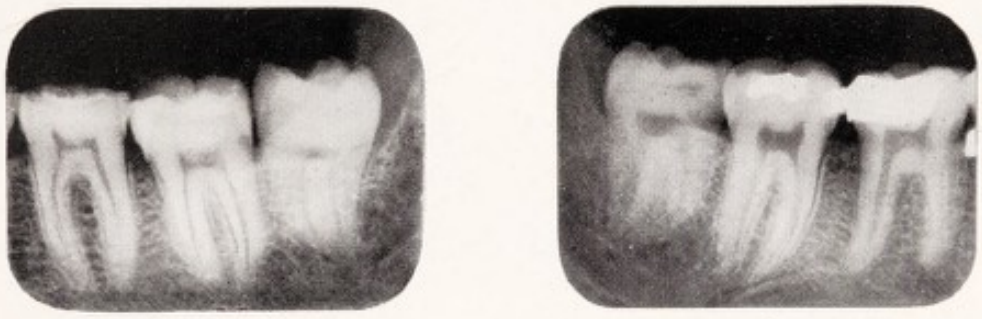
Exolever Technic—Mesial Application.—The exolever technic in this type of impaction is not so definite a procedure as where the character of the root formation and septum can be determined. Exolever No. 1L or 1R is selected, and the blade is adjusted to the surface that would normally be the mesial surface, the second molar being utilized as a fulcrum when it is not deflected buccally, after which the tooth is directed distally into the space created on the surface that would normally be the distal surface. If the fulcrum is lost while directing the tooth distally, and it is observed that the tooth can be directed farther distally, an exolever with a larger blade is employed to direct the tooth as far distally as the condition may indicate. If the mesial surface is located at the surface that would normally be the buccal, very little resistance will be presented, and the torsional deflection will be favorable for the exolever technic. If the mesial surface is not located at the surface that would normally be the buccal, resistance may be expected, as no definition of the character of the root formation or bifurcation can be obtained, and there is no other recourse than to direct the tooth distally, with the anticipation of a fracture of the roots. Where the tooth is deflected buccally, the operator takes advantage of that part of the accessible mesial surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second for the execution of the exolever technic, and the technic is the same as for a mesial application where the tooth is deflected buccally and the mesial surface is accessible (page 400). Where the tooth is deflected buccolingually the technic is the same as described for a buccolingual deflection where the mesial surface is accessible (page 440).

Buccal Application.—When the tooth has been loosened, exolever

No. 10L for the left side or No. 10R for the right side is selected, and the blade is applied with caution to the surface that would normally be the buccal surface distal to the point where a normal bifurcation would be located. If the exolever cannot be securely adjusted at this point, it is applied to the surface that would normally be the center of the distal surface. The blade is sent down on the surface that would normally be the distal to a point where a secure adjustment can be obtained, when the handle of the exolever is turned distally and the tooth is directed out of its socket. The ossistructure on the distal surface will serve as a good fulcrum in this type of case.

SUMMARY OF CASES

In the case shown in Fig. 473 A the area that would normally be the mesial surface is accessible to the immediate application of the exolever, and the ossistructure on the surface that would normally be the distal is involved by a pathologic condition, and no excision is indicated. The exolever is applied to the surface that would normally be the mesial to direct the tooth distally to the space created by the pathologic involvement, and the exolever for a buccal application is adjusted at the bifurcation on the surface that would normally be the buccal, which may be located mesial or distal to its approximately normal location.



A B

Fig. 473.—Torsional Deflection with Surface that Would Normally be Mesial Surface Accessible. *A*, mandibular third molar in torsional position, with pathologic condition on surface that would normally be distal. The surfaces that would normally be lingual and buccal are free of ossistructure down to gingival third. *B*, mandibular third molar in torsional position and buccally deflected, with slight pathologic condition on surface that would normaliy be distal, and surfaces that would normally be lingual and buccal free of ossistructure.

In the case shown in Fig. 473 B where the third molar, in addition to being in a torsional position, is deflected buccally, the ossistructure on the surface that would normally be the distal is involved by pathologic changes to such an extent that the tooth can be directed distally without excision on the distal surface. The application of the exolever to the surface that would normally be the deflected mesial surface is made as in a case of buccal deflection where the mesial surface is accessible (page 400).

TORSIONAL DEFLECTION, WITH THE SURFACE THAT WOULD NORMALLY BE THE MESIAL SURFACE INACCESSIBLE

Few cases are seen where the third molar is impacted in a torsional position, with the surface that would normally be the mesial inaccessible to the application of the exolever. An occlusal radiogram is made in all cases of this character to ascertain, in addition to the torsional deflection, the possibility of a buccal deflection which cannot be positively determined from a lingual radiogram.

CLINICAL EXAMINATION

Exposed Crown.—No part of the crown is exposed through the gum tissue.

Gum Tissue.—The entire crown is usually covered by gum tissue.

RADIOGRAPHIC INTERPRETATION

Crown.—There is a lack of definition of the pulp chamber of the third molar compared with the first and second molars. The pulp chamber of the third molar is usually obliterated, or is shown only as a small spot.

Roots.—As a rule, no definition of the root formation can be obtained from the radiogram on account of the torsional deflection of the tooth.

Ossistructure.—The ossistructure on the surface that would normally be the mesial, distal, lingual and buccal surfaces usually extends beyond the gingival third up to the occlusal surface and may extend over the entire occlusal surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—An incision of the gum tissue is made as in the case where there is no deflection and the mesial surface is inaccessible (page 387). Where the tooth is deflected buccally, the incision is the same as described for a buccal deflection, with the mesial surface inaccessible (page 411).

Ossistructure Technic.—Where the ossistructure extends over the occlusal surface, or on the surfaces that would normally be the entire mesiobuccal, distal, lingual and buccal, excision is made as in the case of a vertical impaction where there is no deflection or where there is a buccal deflection and the mesial surface is inaccessible (pages 388, 412).

Exolever Technic.—The exolever technic for a mesiobuccal application is the same as in the case where there is no deflection and where the mesial surface is accessible (page 368). If there is a buccal deflec-

tion, the exolever technic is the same as in a case of buccal deflection where the mesial surface is accessible (page 400), and a buccal application is made as in a case of torsional deflection where the mesial surface is accessible (page 450).

SUMMARY OF CASES

In the case shown in Fig. 474 the roots have the appearance of being inclined distally. Excision is made over the surface that would normally be the distoclusal and on the surface that would normally be the distal, and this is followed by an excision on the surface that would normally be the buccal, the excision extending quite a distance down on this surface. After this procedure, excision is made on the surface that would normally be the mesiobuccal to allow the application of the exolever to this surface. When excision of the ossistructure has been made, exolever No. 9L for the left side or No. 9R for the right side is adjusted to the surface that would normally be the mesiobuccal, when a wedge is created at this point by the application of the exolever to the tooth, which is loosened by this procedure. Owing to the contact of the roots of the second and third molars, no attempt should be made to direct the tooth out of the socket distally, the extraction being completed by a buccal application.

Fig. 474.—Vertical Impaction—Torsional Deflection with Surface that Would Normally be Mesial Surface Inaccessible. Mandibular third molar in a torsional position, with ossistructure extending over entire tooth with exception of occlusal surface.

ISOLATED POSITION, WITH THE MESIAL SURFACE ACCESSIBLE

Where the second molar has been previously extracted and the third molar left in an isolated position, with its extraction indicated, the operator takes advantage of the broad mesial surface for the adjustment of the exolever, utilizing the ossistructure anterior to the mesial surface as a fulcrum. In a case of this character an exolever technic is preferable to a forceps technic, and less trauma will result where a correct exolever technic is executed.

CLINICAL EXAMINATION

Exposed Crown.—In some cases parts of the occlusal and mesial surfaces are exposed.

Gum Tissue.—A part or the whole of the crown is covered by gum tissue.

RADIOGRAPHIC INTERPRETATION

Crown.—Where the tooth is deflected lingually, a part of the occlusal surface will be shown, but where the tooth is not deflected lingually, no part of the occlusal surface will be visible. Where the tooth is deflected buccally, no definition of the deflection can be obtained from the radiogram and must be ascertained in the clinical findings when the gum tissue has been retracted, or from the occlusal radiogram. A torsional deflection can be determined in the radiogram by the lack of definition of the pulp chamber and roots.

Roots.—The root formations that may occur in this class of impaction are similar to those seen in other types of vertical impaction where the second molar is *in situ*.

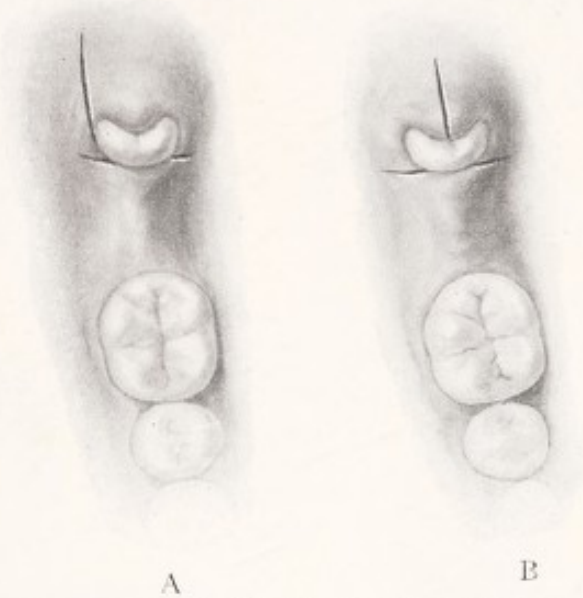
Ossistructure.—Examination is made of the ossistructure with special reference to that part of the mesial surface that is free of ossistructure from the occlusal surface down to the gingival third. Where the mesial surface is free of ossistructure, no excision is indicated, but, where the ossistructure extends over the occlusal surface or on the distal surface, excision is indicated. The amount of ossistructure that may be on the buccal surface is determined to ascertain the possibility of making a buccal application of the exolever where the character of the root formation indicates such an application, and excision is made where necessary. Where the ossistructure on the mesial, distal, lingual and buccal surfaces is involved by a pathologic condition, excision on the buccal surface is indicated where a suitable fulcrum cannot be obtained on this surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—Where the mesial surface is not free of gum tissue, an incision is made to allow the application of the exolever to this surface without injury to the gum tissue. Where parts of the occlusal and mesial surfaces are visible, slight incisions lingual and buccal to the mesial surface are made. A second incision is made along the buccal surface, starting at the mesial surface and continuing distally to a point that will permit excision of the ossistructure on the distal surface and allow the application of the exolever to the buccal surface (Fig. 475 A). Where a buccal application is not indicated, the incision is made distally over the center of the occlusal surface (Fig. 475 B).

Ossistructure Technic.—The mesial surface is free of ossistructure from the occlusal surface down to the gingival third, and no excision is indicated. Where the ossistructure extends over the distoclusal surface, excision is made as described on page 349; where excision is indicated on the distal surface, it is made as described on page 342, and where excision is indicated on the buccal surface, it is made as described on page 350.

Exolever Technic.—When the necessary excision of the ossistructure has been made, exolever No. 11L, 11R; No. 12L, 12R; or No. 13L, 13R is selected, and the gum tissue over the broad mesial surface is displaced with the back of the blade, the point of the blade being kept in



A B

Fig. 475.—Incision of Gum Tissue—Isolated Position—Vertical Impaction—Mesial Surface Accessible. *A*, incision lingually and buccally along mesial surface and distally along buccal surface; *B*, incision along mesial surface and distally over center of occlusal surface.

alignment with the center of the mesial surface (Fig. 476 A). The blade is sent down on the mesial surface to a point where its progress is stopped by the ossistructure, and, when the adjustment has been made, the back of the blade will rest on the ossistructure anterior to the mesial surface (Figs. 476 B, 476 C). The tooth is directed distally by turning the handle of the exolever mesially (Fig. 476 D), the ossistructure anterior to the mesial surface being used as a fulcrum, which will not be sufficient stability where the second molar has been recently extracted, but will be fairly firm when bone regeneration has filled the socket created by the extracted tooth. The exolever movements to direct the tooth distally and upward are executed in conformity with the root formation, as in the case of a vertical impaction where there is no deflection, mesial application, and the second molar is *in situ* (page 355). A buccal application, when indicated,

is made to complete the extraction, and the technic is the same as described on page 361. In a great many cases where the roots are fused, where both roots are straight, or where the septum will not be a resisting factor, the tooth can be extracted by a buccal application independent of a mesial application.

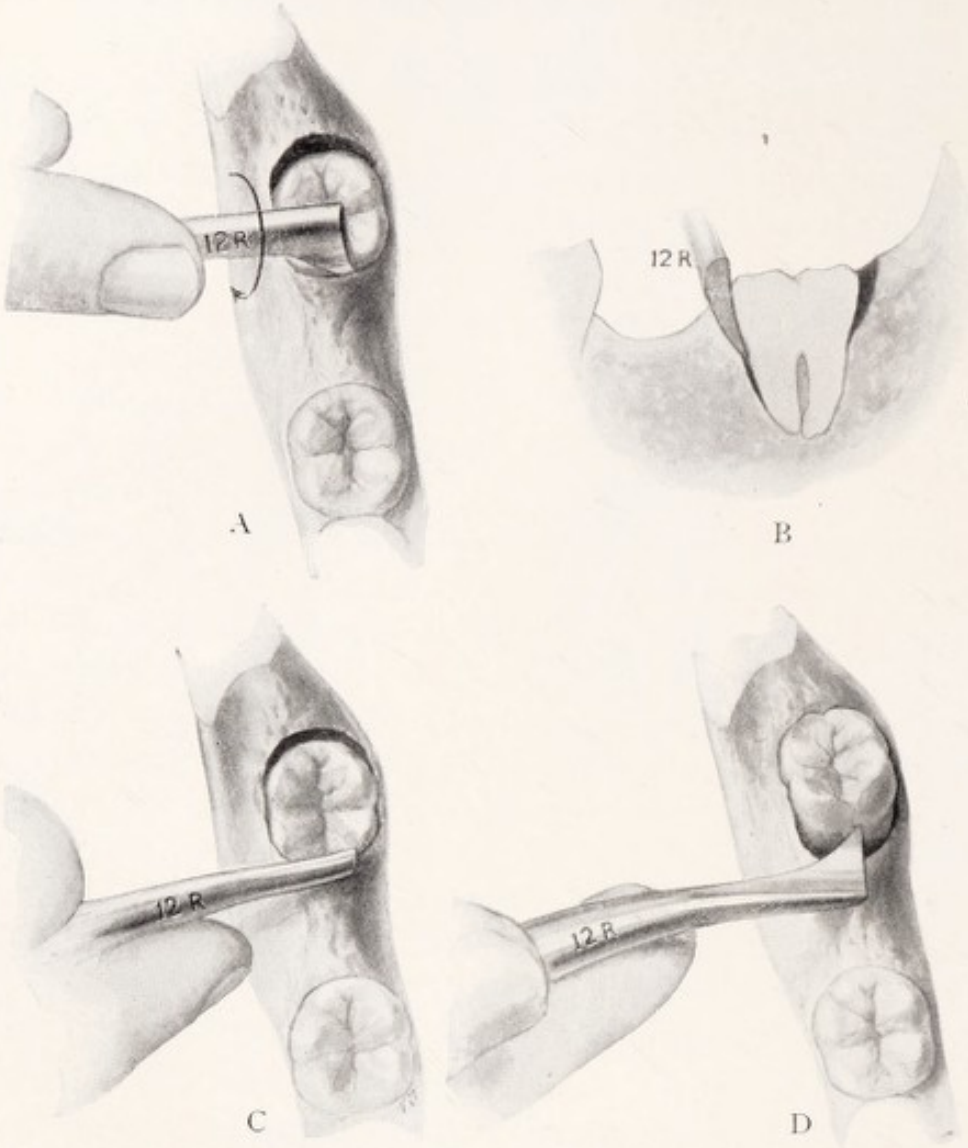


Fig. 476. — Mesial Application of Exolever—Vertical Impaction—Isolated Position. *A*, exolever No. 12R being applied to mesial surface; *B*, view showing exolever blade adjusted on mesial surface; *C*, exolever blade adjusted, viewed from occlusal; *D*, tooth directed upward and distally by turning handle mesially.

SUMMARY OF CASES

In the cases shown in Fig. 477, where the mesial surface is free of ossistructure from the occlusal surface down to the gingival third, no excision on this surface is indicated. The ossistructure over the distoclusal surface is excised in advance of the ossistructure on the distal surface, and no excision on the buccal surface will be necessary on account of the character of the root formation. The exolever is applied to the broad mesial surface, the ossistructure anterior being

utilized as a fulcrum, and the tooth is directed distally. When the tooth has been directed to some extent distally and upward, the extraction is completed by a buccal application.

In the cases shown in Fig. 478 a pathologic condition has involved the ossistructure on the mesial, distal, lingual and buccal surfaces. These cases may appear very simple in the radiogram, but the extraction is complicated on account of the root formation and the lack of a

Fig. 477. — Vertical Impaction—Isolated Position—Mesial Surface Accessible. The ossistructure extending over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

suitable fulcrum on the mesial or buccal surface. Where a good fulcrum is not obtainable on the mesial surface, excision is made anterior to this surface, and, if a buccal application of the exolever is indicated, excision is necessary to provide a suitable fulcrum. The exolever blade is adjusted to the broad mesial surface to direct the tooth distally in conformity with the root formation. Where both roots are inclined distally and there is sufficient space on the distal surface to permit

Fig. 478. — Vertical Impaction—Isolated Position—Mesial Surface Accessible. The ossistructure on mesial, distal, lingual and buccal surfaces is involved by a pathologic condition.

the tooth to be directed into this space, the application of the exolever to the mesial surface is repeated until the extraction is completed. Where there is no distal inclination of the roots, the extraction is completed by a buccal application.

In Fig. 479 are shown two radiograms each of two cases where the mesial surface was accessible, presenting the condition before and after extraction. Excision was made on the distal surface, but no excision was indicated on the buccal surface, as in these cases the

exolever can be applied to the greater part of the mesial surface and the tooth can be directed farther distally and upward than in those cases where the available mesial surface is limited on account of the presence of the second molar. These cases demonstrate that only a minor injury may be caused to the ossistructure when a correct exolever technic is followed.

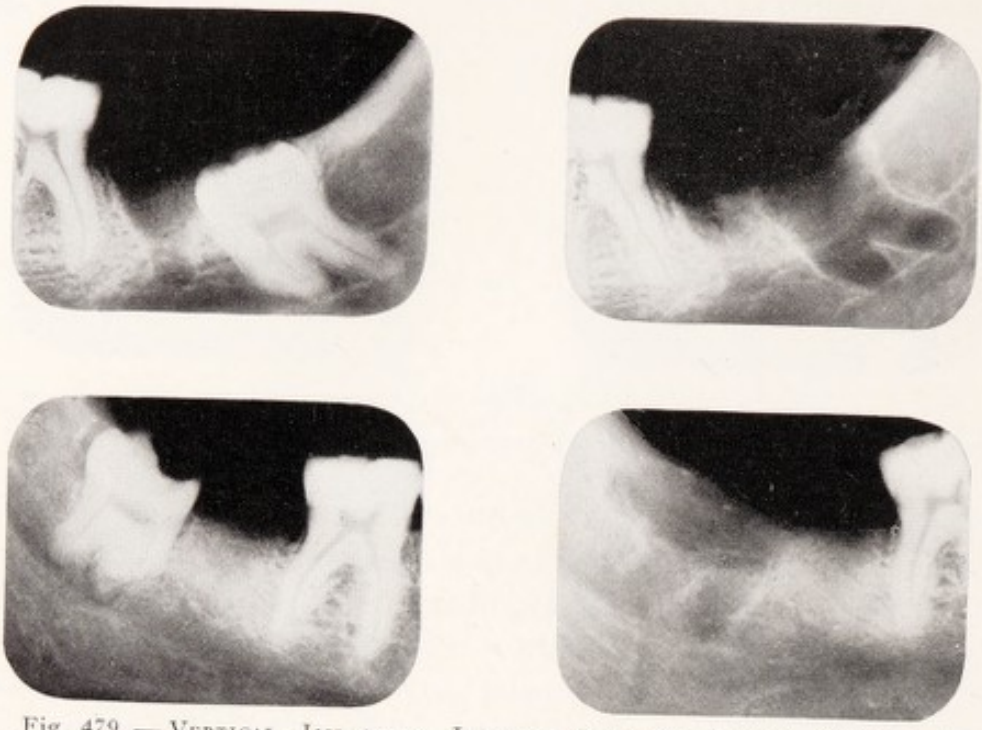


Fig. 479. — Vertical Impaction—Isolated Position—Mesial Surface Accessible. Two radiograms are shown of each case respectively before and after extraction.

ISOLATED POSITION, WITH THE MESIAL SURFACE INACCESSIBLE

Where the third molar is in an isolated position, with the mesial surface inaccessible to the immediate application of the exolever, the extraction will be greatly simplified if the ossistructure anterior to the mesial surface is in a normal condition and can be utilized as a fulcrum.

CLINICAL EXAMINATION

Exposed Crown.—Rarely is any part of the crown exposed.

Gum Tissue.—The gum tissue usually covers the entire crown.

RADIOGRAPHIC INTERPRETATION

Crown.—Where the tooth is deflected lingually, a part of the occlusal surface will be shown, but, where the tooth is not deflected lingually, no part of the occlusal surface will be visible. Where the tooth is deflected buccally, no definition of the deflection can be obtained from a lingual radiogram, but can be ascertained by the clinical findings when the gum tissue has been retracted and from an occlusal radiogram.

Roots.—The root formations that may occur in this class of impaction are similar to those seen in other types of vertical impaction where the second molar is *in situ*.

Ossistructure.—The ossistructure extends over the entire mesial, lingual, distal and buccal surfaces, and often over the distoclusal surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—Where the gum tissue extends over the entire tooth, a definite point for incision of the gum tissue can be determined by measuring in the radiogram the distance between the first and third molars if the first molar is present. When the mesial surface has been determined, an incision is made on this surface from the lingual to

Fig. 480. — Incision of Gum Tissue—Vertical Impaction—Isolated Position—Mesial Surface Inaccessible. Incision extending along entire mesial surface, lingually and buccally from incision made on mesial surface, anterior to mesial and buccal surfaces and distally along buccal surface.

the buccal surface. Where the tooth is deep-seated the incision is continued lingually and buccally from the mesial surface. A second incision is then made anterior to the mesial surface in alignment with the buccal and lingual surfaces, so that a flap can be retracted, and a third incision is then made distally along the buccal surface to a point that will permit excision of the ossistructure on the distal surface (Fig. 480).

Ossistructure Technic.—In order to adjust the exolever to the mesial surface, excision of the ossistructure is indicated, starting at the center of this surface. Ossisector No. 7L for the left side or No. 7R for the right side is selected, the gum tissue on the mesial surface is displaced with the back of the blade, and the blade is adjusted to the ossistructure slightly anterior to the mesial surface,

when it is directed, with pressure under control, toward the center of this surface (Fig. 481). When the mesial surface has been reached, the blade is directed farther anteriorly to the part excised, the excision being continued laterally to the first excision until the mesial surface is sufficiently free of ossistructure to allow the exolever to be adjusted. Excision is made over the distoclusal surface as described on page 349, on the distal surface as described on page 342, and on the buccal surface at or distal to the bifurcation as in a case of vertical impaction where there is no deflection and the mesial surface is inaccessible (page 350). Where the ossistructure extends over the lingual fourth or half of the occlusal surface, excision

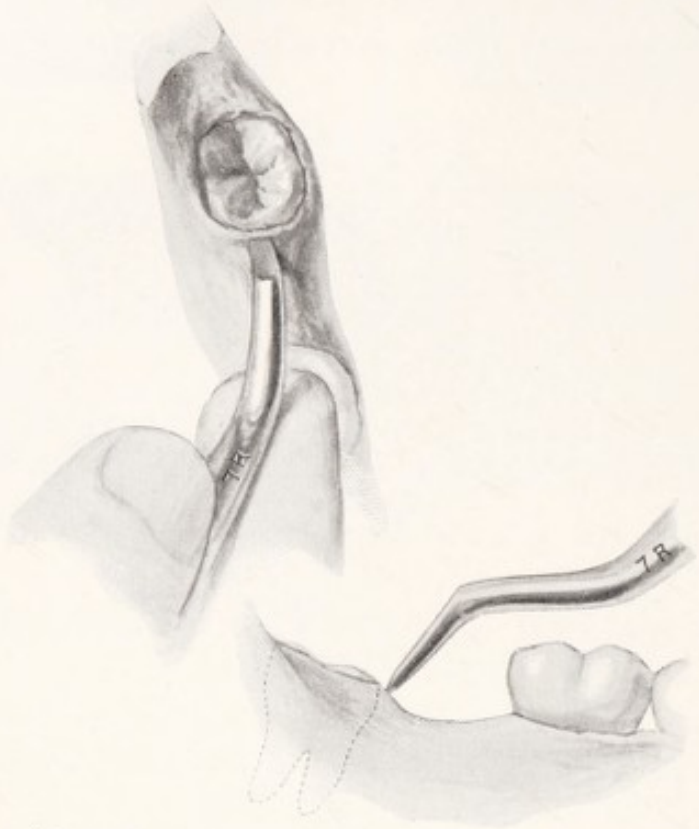


Fig. 481. — Mesial Excision of Ossistructure—Vertical Impaction—Isolated Position—Mesial Surface Inaccessible. Ossisector No. 7R applied for excision of ossistructure on mesial surface.

must be made over the latter surface in advance or the exolever movements cannot be properly executed. This excision is made as described on page 390.

Exolever Technic.—When the necessary excision of the ossistructure over the distoclusal surface and on the mesial, distal and buccal surfaces has been made, the exolever technic is executed as described in a case of isolated impaction where the mesial surface is accessible (page 455). The gum tissue on the mesial surface is displaced with the back of the blade, and the blade is sent down on the mesial surface, with pressure under control, to a point where a

secure fulcrum can be obtained on the ossistructure anterior to this surface. The handle of the instrument is turned mesially, and the tooth is directed distally and upward in conformity with the root formation. The extraction is completed by a buccal application as described on page 361.

Fig. 482. — Vertical Impaction—Isolated Position—Mesial Surface Inaccessible. The ossistructure extends over entire mesial, distal, lingual and buccal surfaces.

SUMMARY OF CASES

In Fig. 482 is shown a case of the third molar in an isolated position, with the mesial surface inaccessible to the immediate application of the exolever. Excision of the ossistructure on the distal and buccal surfaces is indicated, and excision anterior to the mesial surface is also indicated for the adjustment of the exolever to this surface. The exolever is adjusted to the mesial surface in order to direct the tooth distally and upward in conformity with the root formation, when a buccal application is made to complete the extraction.

CHAPTER XVII

Operative Technic in Mesioangular Impaction

WHERE it is shown by the clinical examination and radiographic interpretation that the mandibular third molar is impacted in a mesioangular position, the technic for extraction, when such a procedure is indicated, should be executed in conformity with the position of the tooth, its root formation, its supporting ossistructure and its relation to the second molar. While the impacted tooth is described as being in a mesioangular position, its buccal surface may be in alignment with the corresponding surface of the second molar, or the tooth may be deflected buccally, lingually or buccolingually, and in an occasional case there may be a torsional deflection.

A mesioangular impaction occurs as frequently as a vertical impaction. As is the case in a vertical impaction, the object to be attained is the elimination of the forceps, as a forceps technic in a mesioangular impaction has the same disadvantage as is presented in a vertical impaction. Where the ossistructure extends beyond the gingival third, it is difficult to apply the beaks of the forceps, and an extensive preparation of the ossistructure on both the buccal and lingual surfaces is necessary in order to adjust the beaks. Especially will this disadvantage be experienced in a case where the ossistructure on the buccal and lingual surfaces extends up to the occlusal surface, in which case extensive preparation of the ossistructure will be unnecessary if an exolever technic is followed, the excision being limited to a definite area for the application of the exolever and the execution of the exolever movements. The former common practice of cutting away with a bur or stone that part of the crown of the third molar impinging upon the distal surface of the second molar has been found to be an unnecessary procedure. When that part of the crown of the third molar in contact with the distal or distobuccal surface of the second molar is excised, the operator will not be able to use that part of the tooth to which an exolever could have been applied, and it is found to be an advantage to have the crown of the third molar intact.

Particular attention should be given to the mesial surface of the third molar, the distal surface of the second and the superior border of the ossistructure for the purpose of ascertaining whether the mesial surface is available for the application of the exolever, and,

if the mesial surface is accessible, to determine the size of the exolever blade to be used.

Where the mesial surface of the third molar is inaccessible to the application of the exolever on account of its relation to the superior border of the ossistructure, access with the exolever to the mesial surface of the third molar is the important object to be attained, and this cannot be accomplished unless the operator excises a sufficient amount of the ossistructure at the point most advantageous to allow the proper application of the instrument.

The importance of studying carefully the radiogram in advance of the operation should always be borne in mind, and in this type of case this precaution should be closely followed. Failure to note in the radiogram that the mesial surface of the third molar is not readily accessible to the application of the exolever is usually followed by an unsuccessful attempt to apply the exolever, accompanied by trauma, and the operator in such a case should make the necessary excision of the ossistructure before undertaking the application of the exolever to the mesial surface. Special attention is given to the contact of the occlusal and mesial surfaces of the third molar with the distal and distobuccal surfaces of the crown and distal root of the second molar, as shown in the radiogram, to determine whether these parts are affected by caries or pressure absorption. Wherever possible, the second molar should be retained.

The formation of the roots of the third molar is a matter of important consideration, as their formation will, in a large measure, govern the extent of excision of the ossistructure to be made on the distal surface. In the greater number of cases the entire crown is covered by gum tissue, and the findings in the radiogram will be of great value to the operator in determining the existing condition.

Special care should be taken where there is a buccolingual deflection of the tooth, and the operator should carefully consider that part of the third molar in contact with the distobuccal surface or distal root of the second molar before any attempt is made to execute the exolever movements.

The excision of the ossistructure and the application of the exolever is executed in such a way as to avoid injury to the distal surface of the crown, roots or peridental membrane of the second molar. The excision is made to conform to the position of the third molar and to the application of the exolever that can be made to its mesial and buccal surfaces, and at the same time permit the exolever movements to be made in conformity with the root formation. The ossistructure is used as a fulcrum wherever possible, and in an occasional case, where it is absolutely necessary, the second molar

is engaged for this purpose. The ossistructure anterior to and below the mesial surface of the third molar, where it is not extensively involved by a pathologic condition, will make a good fulcrum and should be utilized to direct the tooth distally.

For the purpose of describing systematically the technic in the various types of mesioangular impaction of the mandibular third molar, the following classification is used:

1. No deflection, with the mesial surface accessible
2. No deflection, with the mesial surface inaccessible
3. Buccal deflection, with the mesial surface accessible
4. Buccal deflection, with the mesial surface inaccessible
5. Lingual deflection, with the mesial surface accessible
6. Lingual deflection, with the mesial surface inaccessible
7. Buccolingual deflection, with the mesial surface accessible
8. Buccolingual deflection, with the mesial surface inaccessible
9. Torsional deflection, with the surface that would normally be the mesial surface accessible
10. Torsional deflection, with the surface that would normally be the mesial surface inaccessible
11. Isolated position, with the mesial surface accessible
12. Isolated position, with the mesial surface inaccessible

NO DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

A common type of impaction is where the third molar is in a mesioangular position, with the buccal and lingual surfaces in alignment with the corresponding surfaces of the second molar, and the mesial surface of the third molar is accessible to the immediate application of the exolever.

An operator not familiar with the use of the exolever may hesitate to direct the tooth distally and upward in this type of impaction, by the application of the exolever to the mesial surface of the third molar, for fear of disturbing the second molar by the occlusal or mesial surface of the third molar coming in contact with the distal surface of the second. If sufficient excision of the ossistructure on the distal surface of the third molar has been made, so that there will be no resistance at this point, the second molar will not be endangered when the third molar is directed distally and upward, except where the interseptum and the ossistructure supporting the second molar are involved by a pathologic condition to such an extent that its only support is the third molar, in which case the second molar will be unavoidably disturbed.

CLINICAL EXAMINATION

Exposed Crown.—In some cases a part of the occlusal surface, and also a part of the distal surface is exposed; in others, the entire crown is covered by gum tissue.

Gum Tissue.—The gum tissue may be over parts of the occlusal and distal surfaces, or it may be over the entire crown.

RADIOGRAPHIC INTERPRETATION

Crown.—The radiogram shows the crown of the third molar with a definite enamel cap and pulp chamber, but with no part of the occlusal surface visible. There is, as a rule, no marked contact of the crown with the distal surface of the second molar. If there is a contact, it will be very slight, and in that case the mesial surface or a part of the occlusal surface of the third molar will be in slight contact with the distal surface of the second. The contact between the first and second molars shows no overlap. The mesial surface of the third molar available for the application of the exolever will vary according to the extent of surface that may be free of ossistructure and its relation to the distal surface of the second molar.

Roots.—The root formations that may occcur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root straight, 10; mesial root inclined distally and distal root inclined mesially, 8; divergent roots, 4; both roots straight, 2; both roots inclined distally, 2; mesial root straight and distal root inclined mesially, 2; partially developed roots, 3, and fused roots, 2.

Ossistructure.—The ossistructure on the mesial surface will not interfere with the application of the exolever to this surface. On the buccal surface the location of the superior border of the ossistructure varies, and in the majority of cases the greater part of this surface is free of ossistructure, when no excision is necessary. The distal surface is usually free of ossistructure down to the gingival third, but the structure may extend in some cases up to the occlusal surface, when excision on this surface is indicated. A pathologic condition usually involves the ossistructure on the mesial surface, does not frequently involve the structure on the distal surface and occasionally involves the structure on the mesial, distal, lingual and buccal surfaces in the same case.

OPERATIVE TECHNIC

The angle of approach to the mesial or distal surface for the application of the ossisector or exolever is not as it is in the case where the mesial or distal surface is in a vertical position, but it is in line with the angular position of the mesial or distal surface.

Gum Tissue Technic.—Where the greater part of the crown is exposed and no buccal application of the exolever is indicated, an incision is made over the center of the distal surface to a distance to permit excision, when indicated (Fig. 483 A). This is usually sufficient, as there will be no interference of the gum tissue on the mesial surface when the exolever is adjusted to this surface, and the incision will permit the tooth to be directed distally and upward without causing trauma to the tissue.

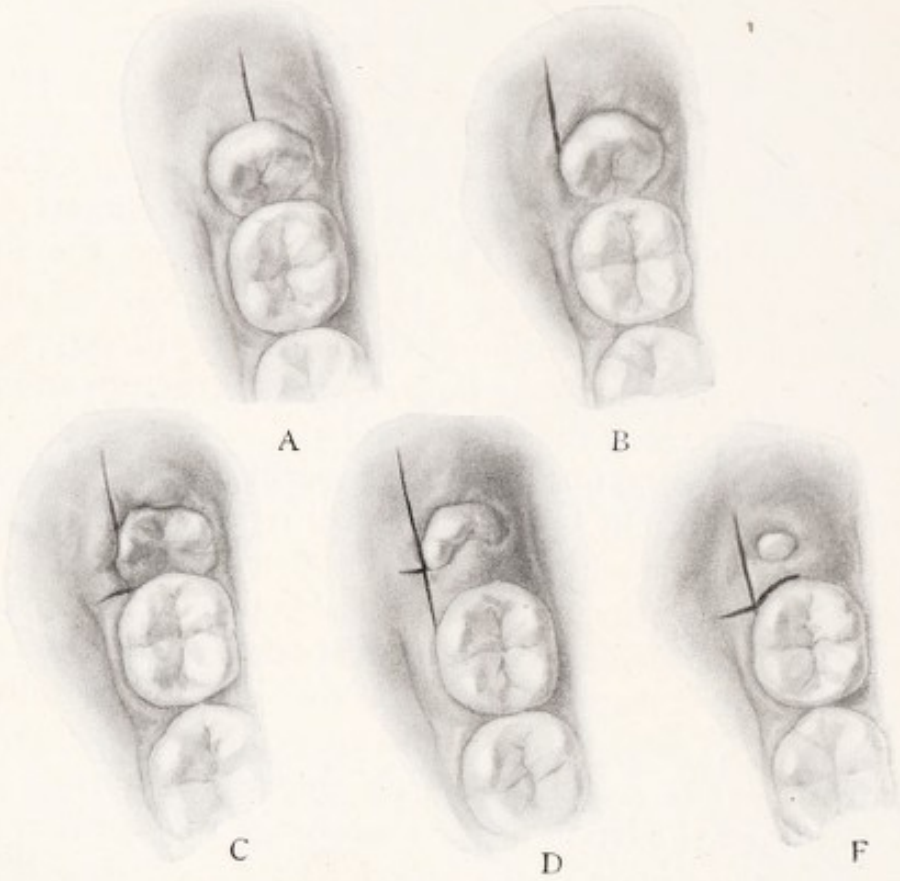


Fig. 483. — Incision of Gum Tissue—Mesioangular Impaction—No Deflection—Mesial Surface Accessible. *A*, incision distally along center of distal surface of third molar; *B*, incision distally along buccal surface; *C*, incision distally along buccal surface and downward and buccally in alignment with mesial surface; *D*, incision distally along buccal surface of third molar, mesially along buccal surface to distobuccal surface of second molar, and downward on buccal surface at point where tissue extends over mesial half of occlusal surface; *E*, incision distally along buccal surface, downward and buccally at distobuccal surface of second molar, and on buccal half of distal surface of second molar.

Where a buccal application is indicated, the incision outlined above is not practicable; an incision made distally in line with the buccal surface (Fig. 483 B), starting at the mesial surface and extending to a point that will permit excision on the distal surface and the tooth to be directed distally and upward, is all that is usually necessary, unless it is observed by the clinical examination that the tissue on the mesial surface is liable to be subjected to trauma when the exolever is applied. If this tissue is liable to be affected, a slight incision is made downward on the buccal surface in alignment with or slightly anterior to the

mesial surface, so that the tissue protecting the buccal surface of the second molar is not displaced (Fig. 483 C).

Where the gum tissue extends over the mesial, occlusal and on the distal surfaces, the incision should conform to the excision of the ossistructure that is to be made on the distal surface and that will allow the application of the exolever to the mesial and buccal surfaces (Figs. 483 D and 483 E). It is a good procedure in all types of mesioangular impaction, after the incision has been made, to displace the tissue from around the crown with an ossisector blade before the ossisector or exolever is applied. Where the gum tissue extends over the entire crown the incision is made as described on page 482.

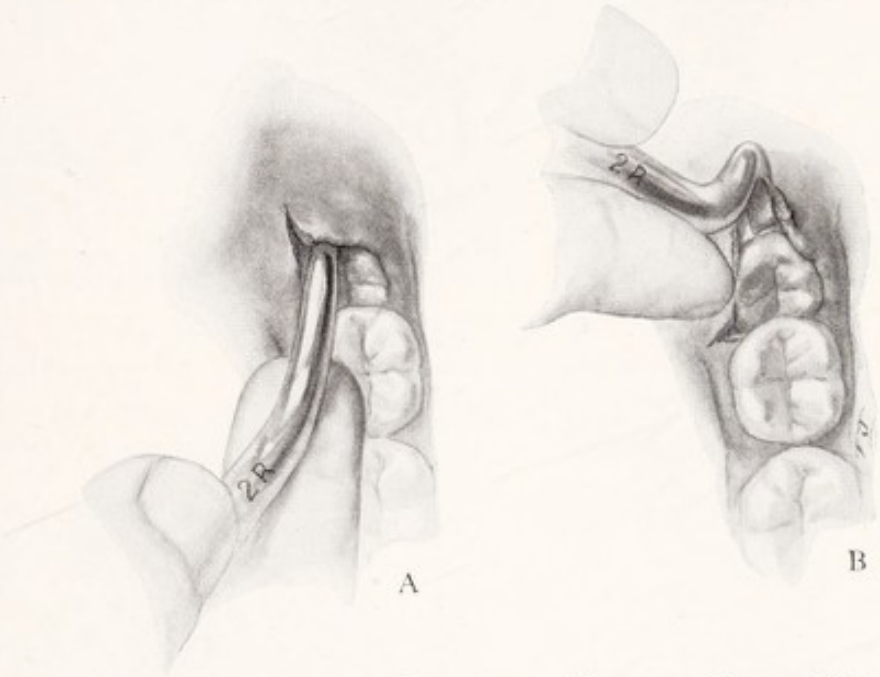


Fig. 484. — Displacing Gum Tissue with Ossisector Blade—Mesioangular Impaction—No Deflection—Mesial Surface Accessible. *A*, blade of ossisector No. 2R applied to displace gum tissue over distoclusal surface; *B*, back of blade displacing gum tissue, with excising edge directed toward ossistructure to be excised.

Ossistructure Technic—Distal Excision.—No excision on the distal surface is indicated where this surface is free of ossistructure from the occlusal surface down to the gingival third unless excision beyond this point will decrease resistance when the root formation indicates such a procedure. Where the ossistructure on the distal surface of the third molar does not extend up to the occlusal surface, the structure is usually more readily accessible for excision than is the ossistructure on the distal surface in a vertical impaction.

Where the operator is proficient in the use of the ossisector, one adjustment of the instrument, with pressure under control, will be sufficient to make a clean excision and leave no jagged edges; but, where the operator is not familiar with the use of the ossisector, several applications with the instrument may be necessary in making the

proper excision. Where excision is made on the distal surface, the amount of ossistructure to be excised is determined from the radiogram, and the angular position of the tooth should be borne in mind. Ossisector No. 2L for the left side or No. 2R for the right side is selected, and the gum tissue over the occlusal and on the distal surface, if present, is displaced with the back of the blade (Fig. 484). The ossisector is directed at an angle (Fig. 485), depending on the extent of excision indicated, distal to the part to be excised, when the

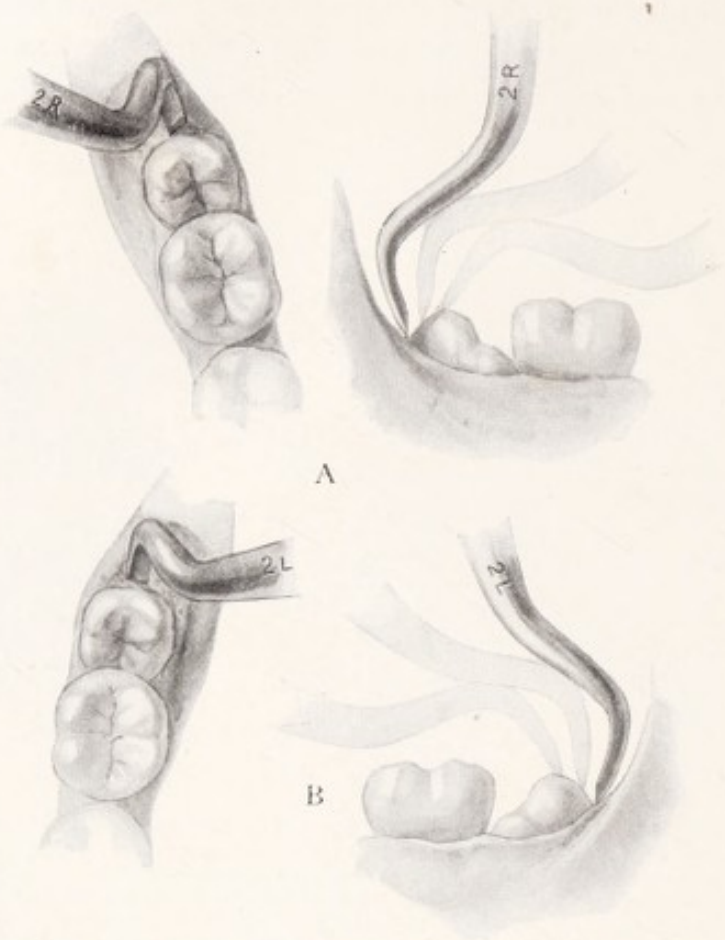


Fig. 485. — Distal Excision of Ossistructure—Mesioangular Impaction—No Deflection—Mesial Surface Accessible. That part of distal surface free of ossistructure is used as a guide to apply ossisector blade to center of distal surface. The instrument is then directed distally to part to be excised. *A*, ossisector No. 2R applied on right side, viewed from occlusal and buccal surfaces; *B*, ossisector No. 2L applied on left side, viewed from occlusal and buccal surfaces.

necessary pressure, under control, is applied. If the initial excision is not sufficient, repeated excisions are made until the distal surface is free of ossistructure to a point where no resistance will be presented.

As the lingual and buccal surfaces of the third molar are in alignment with the corresponding surfaces of the second, no difficulty will be experienced in locating the distal surface.

Exolever Technic—Mesial Application.—The space between the mesial surface of the third molar and the ossistructure below this surface, together with the relation of the mesial surface of the third molar

to the distal surface of the second, will govern the size and shape of the blade of the exolever to be adjusted to the mesial surface for the purpose of executing the exolever movements. After the necessary excision of the ossistructure on the distal surface has been made, the

Fig. 486. — Mandible—Ossistructure on Lingual Surface—Mesioangular Impaction—No Deflection—Mesial Surface Accessible. Lingual view of mandible where ossistructure on lingual surface of impacted tooth is so thin that part of lingual plate will fracture away when tooth is extracted.

exolever movements should conform, as in the case of extraction in a vertical type of impaction, as closely as possible to the root formation.

In this type of case, the second molar is not used as a fulcrum to support the exolever as frequently as when extracting a third molar

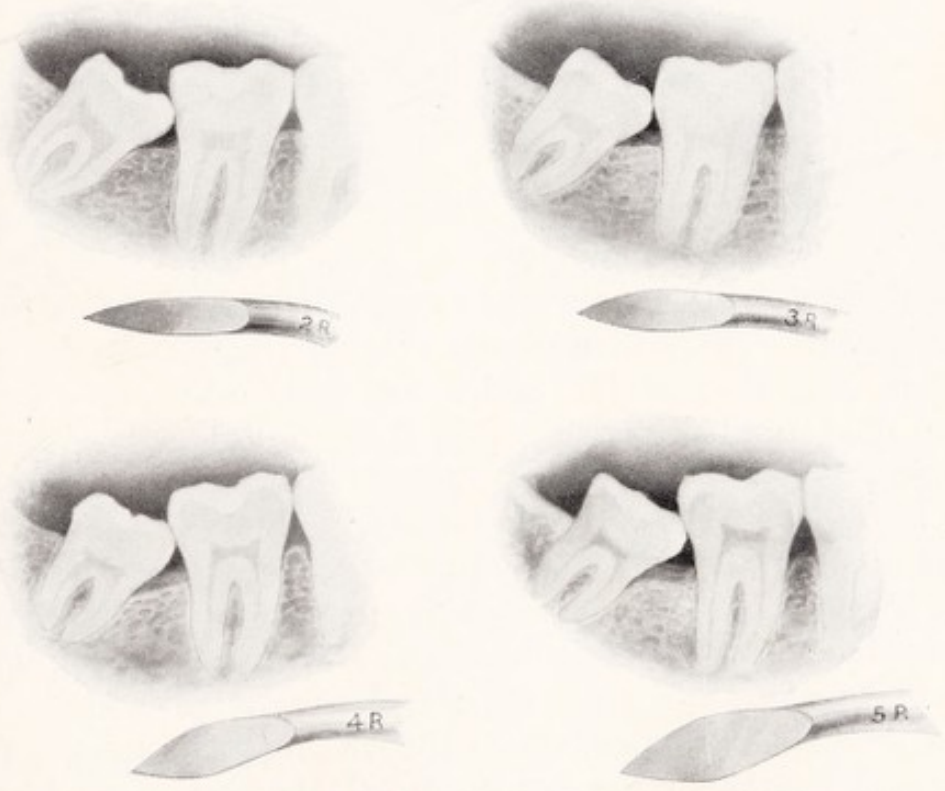


Fig. 487. — Size of Space Between Mesial Surface and Superior Border of Ossistructure—Mesioangular Impaction—No Deflection—Mesial Surface Accessible. Variation in size of space between mesial surface and superior border of ossistructure; also various sizes of exolever blades that are adaptable to the various spaces.

impacted in a vertical position where there is no deflection and the mesial surface is accessible, since in the type of impaction under consideration the ossistructure is used as a fulcrum.

Where the ossistructure does not extend over the greater part of the buccal and lingual surfaces, the ossistructure on the lingual surface at the bifurcation of the roots is usually very thin and part of the lingual plate is liable to be fractured away with the tooth if the exolever movements distally are not made deliberately. In an occasional case the ossistructure on the lingual surface is so thin that, notwithstanding the fact that every precaution is taken when executing the exolever technic, a part of the thin lingual plate is fractured away (Fig. 486).

Exolever No. 2L, 3L, 4L or 5L for the left side or No. 2R, 3R, 4R or

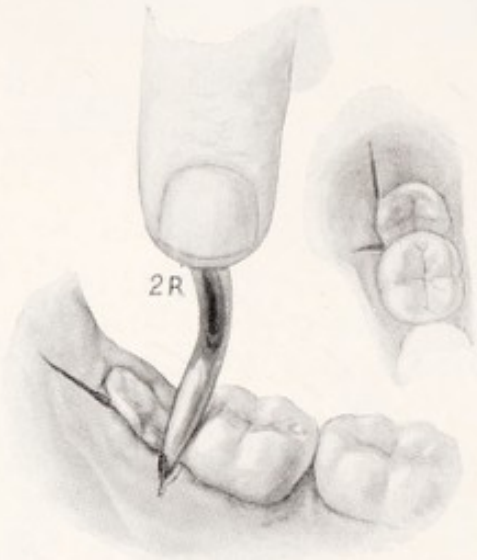


Fig. 488. — Displacing Gum Tissue—Mesioangular Impaction—No Deflection—Mesial Surface Accessible. Exolever No. 2R applied to displace gum tissue on mesiobuccal surface.

5R for the right side is indicated (Figs. 334, 335, 336, 337, pages 284, 286, 287, 288). These instruments are not shaped, respectively, like exolevers No. 1L and 1R, which are used when operating on a vertical impaction, as the shanks of these exolevers are bent so that the approach with the blade can be made in alignment with the angulation of the mesial surface. When selecting the size of exolever to be used, the width of the blade should be slightly larger than the space shown in the radiogram between the mesial surface and the ossistructure below the surface, which is to serve as a fulcrum (Fig. 487).

The blade tapers to a point, thus facilitating initial access. The flat side of the exolever is applied to the mesiobuccal surface, the gum tissue on this surface being displaced with the back of the blade (Fig. 488).

The exolever is applied downward and buccally on the mesiobuccal

surface, and the blade is directed into the space between the mesial surface and the ossistructure below this surface (Fig. 489 A), the blade being kept in alignment with the angular position of the mesial surface. A wedge movement is made, and this often has a tendency to extract the tooth, or at least loosen it so that, by directing it to a slight extent

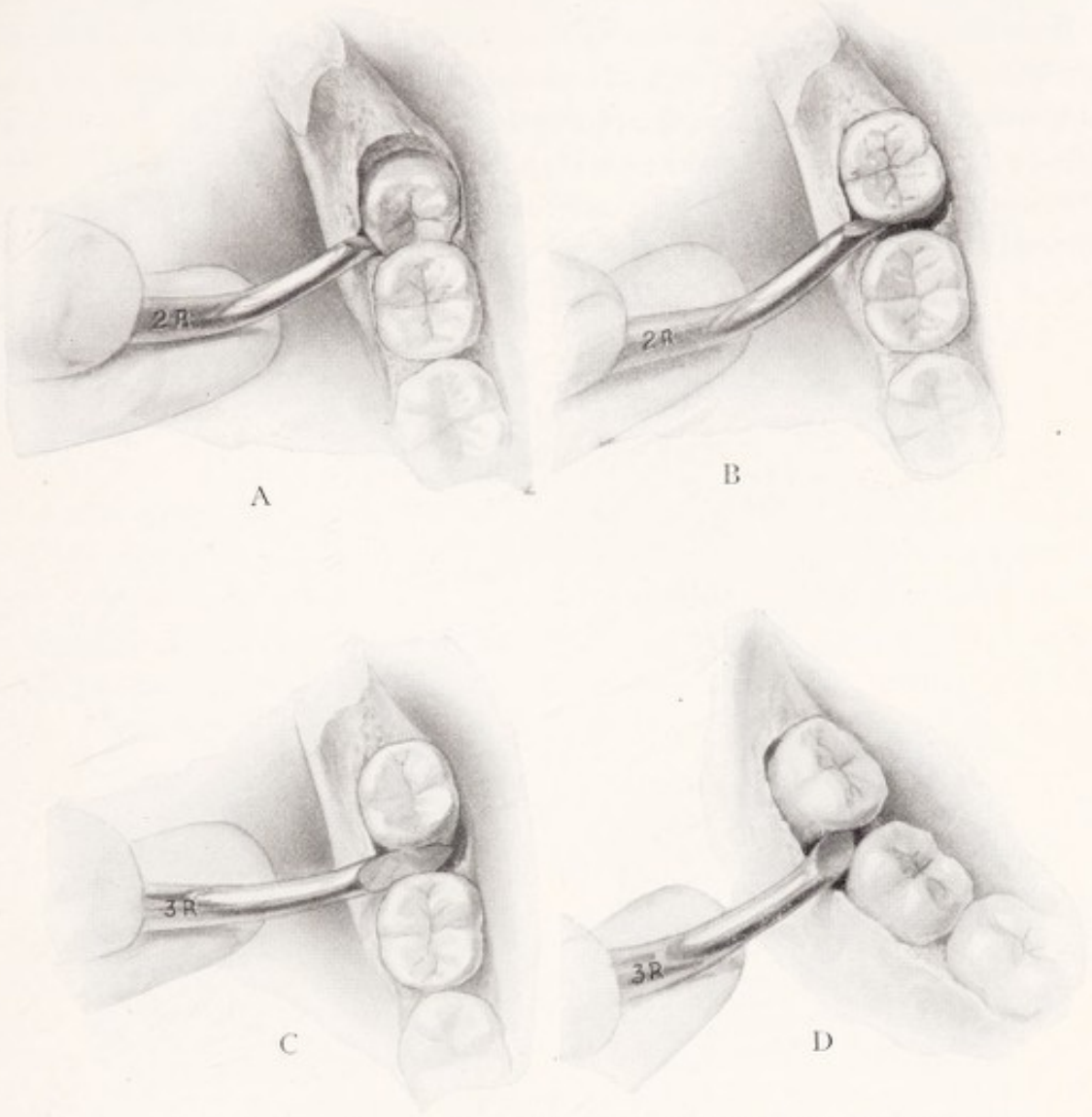


Fig. 489. — Mesial Application of Exolever—Mesioangular Impaction—No Deflection—Mesial Surface Accessible. *A*, exolever No. 2R applied to mesiobuccal surface and blade wedged between mesial surface of third molar and superior border of ossistructure; *B*, blade wedged farther between mesial surface and superior border of ossistructure, latter structure being used as fulcrum. The handle is directed mesially, and tooth is directed distally and upward; *C*, exolever No. 3R applied to mesial surface, with back of blade resting upon ossistructure as fulcrum; *D*, exolever No. 3R applied to mesial surface of third molar, distal surface of second molar being used as a fulcrum to direct tooth farther distally and upward out of its socket.

distally, it will be extracted. If, however, resistance is encountered, the handle of the exolever is turned mesially (Fig. 489 B), and the tooth is directed distally and upward in accordance with the root formation. When executing the exolever technic described above, the size of the blade selected for the initial application is governed by the available

space, and, as the fulcrum is lost when the tooth is directed distally and upward, an exolever with a larger blade is applied (Fig. 489 C). In case the tooth is directed upward to such an extent that the use of the ossistructure as a fulcrum is no longer practicable, the distal surface of the crown of the second molar is used instead for that purpose (Fig. 489 D).

Buccal Application.—Where the tooth has not been extracted by the application of the exolever to the mesial surface, and where the root formation indicates a buccal application, exolever No. 10L for the left side or No. 10R for the right side is selected for this application. After the tooth has been directed distally and upward to a point where it has cleared the distal surface of the second molar and the superior border

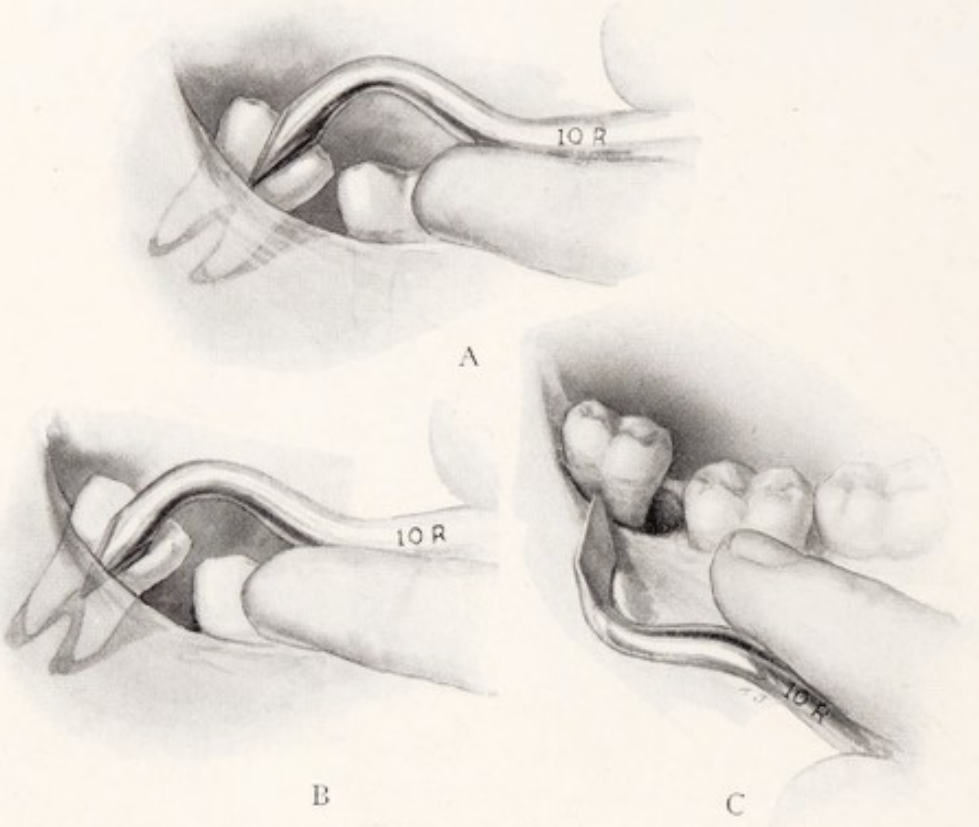


Fig. 490. — Buccal Application of Exolever—Mesioangular Impaction—No Deflection—Mesial Surface Accessible. *A*, exolever No. 10R applied to buccal surface of third molar after tooth has been directed distally and upward by exolever movements applied to mesial surface; *B*, blade wedged downward between buccal surface and ossistructure, and tooth directed upward; *C*, handle directed buccally and tooth upward.

of the ossistructure will not interfere with the adjustment of the exolever to the buccal surface, the gum tissue on this surface is displaced with the back of the blade, and the blade is directed into the bifurcation and the handle of the exolever pressed downward (Fig. 490 A), a wedge being created between the buccal surface and the ossistructure on this surface (Fig. 490 B); this is often sufficient to extract the tooth. If the tooth is not extracted by this procedure the next movement

should engage the point of the blade in the bifurcation, with the back of the blade resting upon the superior border of the ossistructure along the buccal surface, when the handle of the exolever is turned to a slight extent buccally and the tooth is directed upward out of its socket (Fig. 490 C). Where resistance is encountered, repeated applications are made, the blade being sent farther down between the ossistructure and the buccal surface to the bifurcation of the roots.

Where the mesial surface of the third molar is not in contact with the distal surface of the second, and the latter surface will not interfere with an exolever movement upward in line with the axis of the tooth, in a case where the root formation does not require a distal movement in order to overcome the resistance of the septum between them, the operator can make a buccal application of the exolever without resorting to a mesial application. Usually in such a case no excision of the ossistructure is indicated on the distal surface.

SUMMARY OF CASES

In the cases shown in Fig. 491 the mesial root is inclined distally and the distal root is straight, and no excision of the ossistructure on the distal surface is indicated. As a result of a pathologic condition of the ossistructure below the mesial surface, there is a variation in these cases in the size of the space available for the application of the exolever. The exolever blade to be adjusted to the mesial surface should

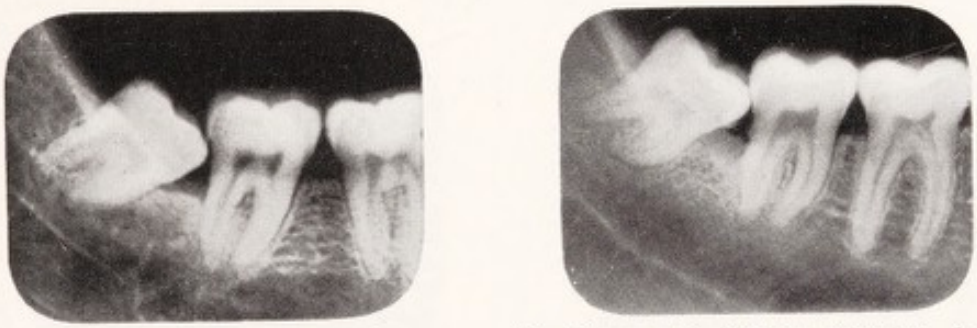


Fig. 491. — Mesioangular Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with ossistructure on distal surface extending slightly beyond gingival third, and greater part of lingual and buccal surfaces free of ossistructure.

be slightly larger than the space shown in the radiogram. The blade of the exolever tapers to a point, and the operator should endeavor to make the adjustment between the mesial surface and the ossistructure below this surface, so that it may act as a wedge which should loosen the tooth on the initial application of the instrument. When the adjustment has been made and the tooth has not been loosened by the wedge created, a definite movement, on account of pathologic changes below the mesial surface, is executed to direct the tooth with sufficient force distally far enough to overcome the curvature

of the mesial root, the back of the blade resting on the ossistructure below the mesial surface as a fulcrum. The movement is made with sufficient force to loosen the tooth on the initial application by turning the handle of the exolever mesially. In the majority of cases this movement will extract the tooth, but, if the tooth is only loosened and directed far enough distally to conform with the distal inclination of the mesial root, the exolever employed is adjusted to the buccal surface in such a manner that the blade is wedged between the buccal surface and the ossistructure on this surface, when the tooth is extracted by this procedure. If resistance is encountered, the handle of the exolever is pressed downward, and this will cause the point of the blade to engage the bifurcation, and, with the superior border of the ossistructure used as a fulcrum, the tooth is directed upward out of its socket. One not accustomed to this procedure should resort to applying exolever No. 10L for the left side or No. 10R for the right side on the buccal surface at the bifurcation in order to complete the extraction, as described for a buccal application on page 472.

In the cases shown in Fig. 492 no excision of the ossistructure on the distal surface is indicated, and the same exolever technic described in the cases shown in Fig. 491 will apply, except where the ossistructure supporting the gingival third of the distal surface of the second molar is involved by a pathologic condition to such an extent that there is a liability of disturbing this tooth in case the exolever comes in contact with it, which incident should be avoided. In addition to

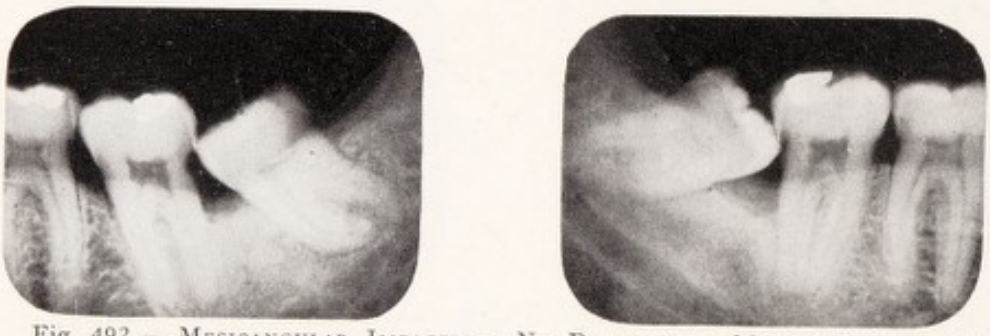


Fig. 492. — Mesioangular Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with ossistructure on distal, lingual and buccal surfaces extending to gingival third.

this condition there is a large straight distal root, and, if the tooth is directed too far distally, a fracture of this root will follow. The tooth is, however, directed distally far enough to overcome the curvature of the mesial root, and the exolever is applied to the buccal surface at the bifurcation, when the handle of the exolever is pressed downward, the tooth being extracted with this movement.

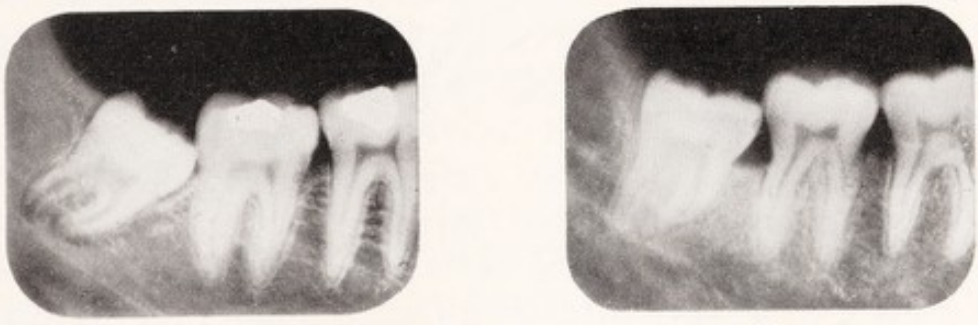
In the cases shown in Fig. 493 no excision of the ossistructure is indicated, and there is a slightly pathologic condition on the mesial, distal, lingual and buccal surfaces. The operative technic is the

same as described for the cases shown in Fig. 491, except that a slight excision of the ossistructure is made on the buccal surface distal to the bifurcation, the extent of the excision being governed by the distance that the tooth will be directed distally and upward by the application of the exolever to the mesial surface.

Fig. 493. — Mesioangular Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with a pathologic condition involving ossistructure on mesial, distal, lingual and buccal surfaces.

In the case shown in Fig. 494 A the mesial root is inclined distally and the distal root is straight, with a pathologic condition slightly involving the ossistructure on the distal surface, but the area affected is not sufficient to obviate excision, which should be made in advance of the execution of the exolever technic. The mesial surface of the third molar is in contact with the distal surface of the second molar at the gingival third, with a very small space between the mesial surface and the ossistructure on this surface for the application of the exolever. There is a slightly pathologic condition anterior to the mesial surface of the third molar.

The position of the mesial surface of the third molar compared with the occlusal surface of the second should be observed, and exolever No. 2L for the left side or No. 2R for the right side is selected for an adjustment to the mesial surface. The gum tissue on the mesiobuccal surface is displaced with the back of the blade, and



A B

Fig. 494. — Mesioangular Impaction—No Deflection—Mesial Surface Accessible. *A*, mesial root inclined distally and distal root straight, with ossistructure on distal surface extending up to occlusal surface and over greater part of lingual and buccal surfaces; *B*, mesial root inclined distally and distal root straight, with large space between mesial surface of third molar and distal surface of second. The ossistructure on distal surface extends up to occlusal surface and over part of lingual and buccal surfaces.

the blade is directed downward on this surface. When the point of the exolever has reached the mesial surface, it is wedged between the mesial surface of the third molar and the ossistructure on this surface, a procedure which should loosen the tooth, when the handle of the exolever is turned mesially, this movement directing the tooth to a slight extent distally. The size of the blade will not, however, permit the movement to be repeated with the same instrument, and exolever No. 3L for the left side or No. 3R for the right side is selected, as the space which has been created by the first movement will allow the latter exolever to be applied to the mesial surface. The movement is made distally far enough to overcome the distal curvature of the mesial root and at the same time bring the tooth distally and upward out of its socket to a point that will allow a buccal application of the exolever to be made to complete the extraction, thus avoiding a fracture of the straight distal root.

In the case shown in Fig. 494 B there is quite a large space between the mesial surface and the ossistructure below this surface. The ossistructure on the distal surface extends up to the occlusal surface and is excised down to the gingival third. The exolever technic described for the cases shown in Fig. 491 is indicated. The blade of the exolever selected should be slightly larger than the space shown between the mesial surface of the third molar and the distal surface of the second.

Fig. 495. — Mesioangular Impaction—No Deflection—Mesial Surface Accessible. *A*, roots fused, with ossistructure on distal surface free down to gingival third and extending over part of lingual and buccal surfaces; *B*, roots fused, with ossistructure on distal surface extending up to occlusal surface and over greater part of lingual and buccal surfaces.

In the case shown in Fig. 495 A there is a complete fusion of the roots, no excision on the distal surface being indicated, and the exolever technic described in the cases shown in Fig. 491 is executed, with the precaution taken that control of the tooth is not lost.

In the case shown in Fig. 495 B there is a complete fusion of the roots, with the ossistructure on the distal surface extending up to the occlusal surface, which structure is excised slightly before the exolever is applied to the mesial surface, when the technic described in the cases shown in Fig. 491 is followed. Where in this type of

case the mesial surface of the third molar as related to the distal surface of the second molar will not interfere with directing the tooth upward, a buccal application can be made independent of a mesial adjustment and then no excision is indicated on the distal surface.

In the cases shown in Fig. 496 the mesial root is inclined distally and the distal root is inclined mesially, with a slightly pathologic condition on the distal surface, but the area involved on that surface is not sufficient to obviate excision at this point. Pathologic changes involve the ossistructure on the mesial, lingual and buccal surfaces, and, where a suitable fulcrum cannot be obtained on the buccal surface, excision is indicated. When the exolever is adjusted to the mesial surface for the purpose of directing the tooth distally, sufficient pressure is applied to fracture the septum between the roots, and the extraction is completed by a buccal application of the exolever.

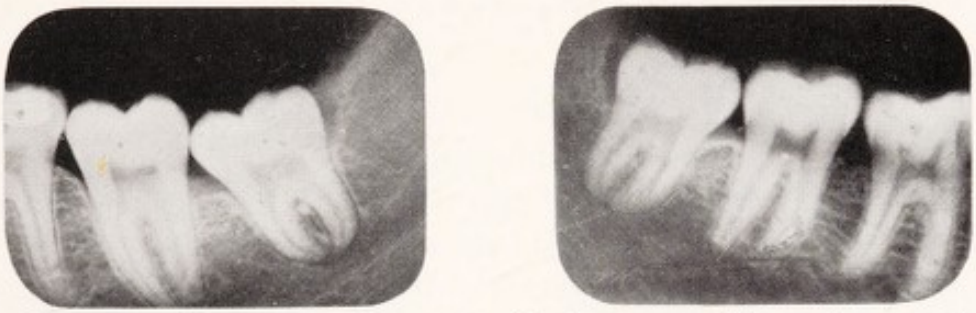
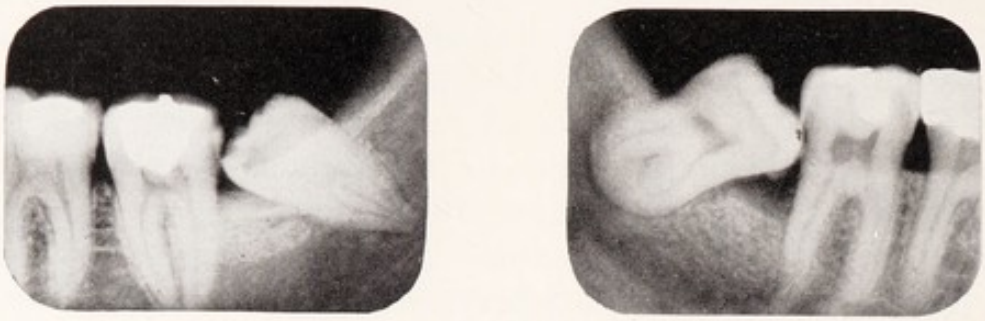


Fig. 496. — Mesioangular Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially, with a pathologic condition involving ossistructure on mesial, distal, lingual and buccal surfaces.

In the case shown in Fig. 497 A the mesial root is inclined distally and the distal root is inclined mesially, and the roots are comparatively small, with a small septum between them. The size of the roots and the septum is such that a fracture of the roots is liable to occur, and, although the tooth is free of ossistructure down to the gingival third, a slight excision is made on the distal surface to decrease resistance. The tooth is directed distally in order to fracture the septum between the roots, but not so far as to cause a fracture of the crown or roots, and dependence should be placed on a buccal application to complete the extraction.

In the case shown in Fig. 497 B the condition is different from that shown in Fig. 497 A. The mesial root is inclined distally and the distal root is inclined mesially, and the roots are large and hypercementosed, with a large septum between them. No excision is indicated, and the exolever blade selected should be slightly larger than the space between the mesial surface and the ossistructure anterior to this surface. When the exolever is adjusted, consider-

able pressure should be applied on the initial application to fracture the septum between the roots, and repeated applications should be avoided. When the tooth is loosened and has cleared the distal surface of the second molar, the extraction is completed by a buccal application.



A B

Fig. 497. — Mesioangular Impaction—No Deflection—Mesial Surface Accessible. *A*, mesial root inclined distally and distal root inclined mesially, roots being small, with very small septum. The ossistructure on distal surface extends up to gingival third and greater part of lingual and buccal surfaces is free of ossistructure; *B*, mesial root inclined distally and distal root inclined mesially, roots being large and hypercementosed. The crown is free of ossistructure down to gingival third of tooth.

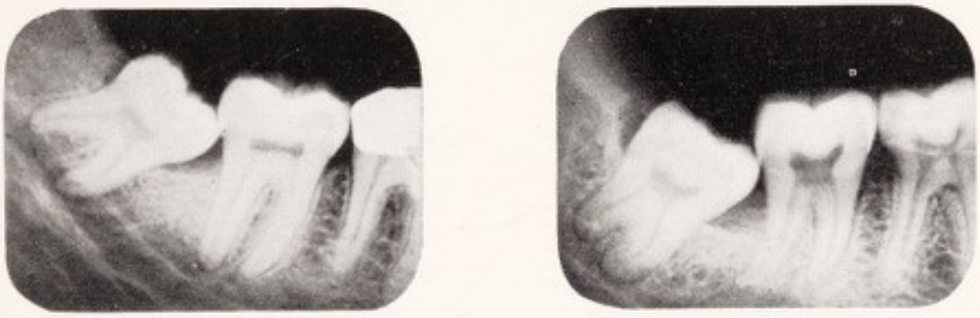
In the cases shown in Fig. 498 the mesial surface is accessible, with a pathologic condition below this surface. The formation of the roots and septum between them indicate that pressure should be applied with the initial application of the exolever in order to fracture the septum, and the technic described in the case shown in Fig. 497 B is followed. Excision on the distal surface is indicated, as in this type of case there is a liability of fracturing a part of the lingual plate, bringing it out with the tooth when the latter is extracted. The probability of this occurrence is decreased by the excision on the distal surface.

In the case shown in Fig. 499 A there is a marked divergency of the roots, with a large septum between them, and excision of the ossistructure on the distal surface is indicated. The exolever is adjusted to the mesial surface, and the tooth is directed to a slight extent distally in order to loosen it, but no attempt should be made to

Fig. 498. — Mesioangular Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially, with a variation of ossistructure on distal, lingual and buccal surfaces.

fracture the septum, as such a procedure is not possible without causing a fracture of the distal root. When the tooth is loosened, it is raised out of its socket to a slight extent distally to clear the distal surface of the second molar, at which time a buccal application is made with an appropriate exolever to the buccal surface at the bifurcation to complete the extraction. Repeated applications are often necessary in a case of this kind.

In the case shown in Fig. 499 B, where both roots are straight, a pathologic condition involves the ossistructure on the mesial, distal, lingual and buccal surfaces, and the only point of excision indicated is on the buccal surface slightly distal to the bifurcation to insure a secure fulcrum. The tooth should be directed distally only far enough to clear the distal surface of the second molar, and the buccal application is repeated as may be necessary if resistance is encountered, as the buccal application will be more effective than any exolever movements applied to the mesial surface, and at the same time prevent a fracture of the roots.



A B

Fig. 499. — Mesioangular Impaction—No Deflection—Mesial Surface Accessible. *A*, there is a marked divergency of roots and a large septum between them. The ossistructure on distal surface, which is slightly involved by a pathologic condition, extends almost up to occlusal surface and over part of lingual and buccal surfaces; *B*, both roots straight, with a pathologic involvement of ossistructure on mesial, distal, lingual and buccal surfaces.

In the cases shown in Fig. 500 there is no pathologic condition on the distal surface, which is free of ossistructure down to the gingival third. On account of the straight mesial root and the distal root inclined mesially, excision of the ossistructure on the distal

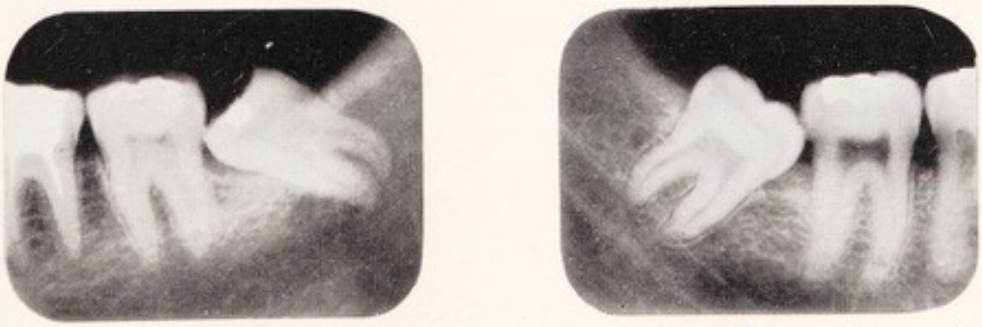


Fig. 500. — Mesioangular Impaction—No Deflection—Mesial Surface Accessible. Mesial root straight and distal root inclined mesially, with ossistructure on distal surface extending to gingival third, and greater part of lingual and buccal surfaces free of ossistructure.

surface is indicated. An exolever with a blade that will approximately fit into the space between the third molar and superior border of the ossistructure is applied to the mesial surface, when the tooth is slightly loosened by directing it distally. The straight mesial root, however, indicates that the tooth should not be directed very far distally, as such a course may cause a fracture of the distal root, and the extraction of the tooth is completed by adjusting the exolever to the buccal surface at the bifurcation.

In Fig. 501, where the cases are similar to those shown in Fig. 500, the length and strength of the roots are factors to be considered, and, as there is a liability of a fracture of one or both roots, the operator should be prepared for their removal. Excision on the distal surface is indicated in order to decrease resistance.

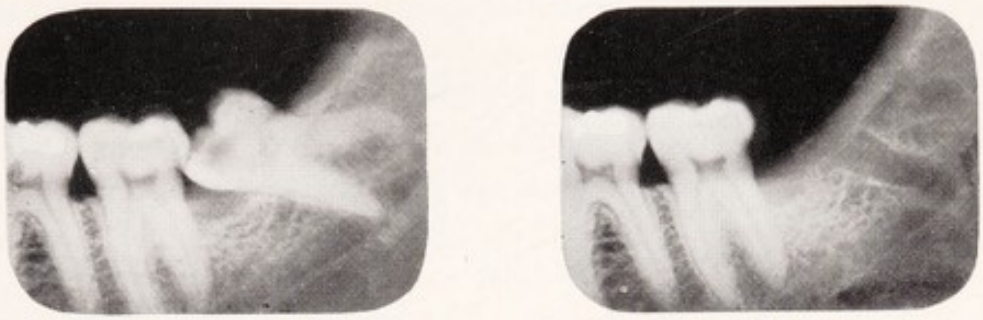
Fig. 501. — Mesioangular Impaction—No Deflection—Mesial Surface Accessible. Mesial root straight and distal root inclined mesially, with ossistructure on distal surface extending up to gingival third, and greater part of lingual and buccal surfaces free of ossistructure.

In the cases shown in Fig. 502, where both roots are straight, with the ossistructure on the distal surface extending to the gingival third, excision is indicated on the latter surface in order to decrease resistance, and the exolever technic is executed as described in the cases shown in Figs. 500 and 501.

In the case shown in Fig. 503 A the roots are very markedly divergent, and, although the distal surface is free of ossistructure down to the gingival third, excision beyond this point is indicated on account of the root formation. Exolever No. 3L for the left side or No. 3R for the right side is applied to the mesial surface to loosen

Fig. 502. — Mesioangular Impaction—No Deflection—Mesial Surface Accessible. Both roots straight, with ossistructure on distal surface extending slightly beyond gingival third, and part of lingual and buccal surfaces free of ossistructure.

the tooth and direct it to a slight extent distally, so that the occlusal surface will clear the distal surface of the second molar when a buccal application is made. Exolever No. 10L for the left side or No. 10R for the right side is selected for a buccal application, which is made at the bifurcation, when the handle of the exolever is turned buccally, which procedure will extract the tooth without causing a fracture of either root, and often leave the septum between the roots intact. In Fig. 503 B is shown the case after the impacted tooth was extracted, with the septum intact.



A B

Fig. 503. — Mesioangular Impaction—No Deflection—Mesial Surface Accessible. Same case. *A*, divergency of roots, with ossistructure on distal surface extending to gingival third and lingual and buccal surfaces free of ossistructure; *B*, socket after extraction.

In the case shown in Fig. 504 A the mesial root is straight and the distal root, which is extremely long, is inclined distally. This is an unusual root formation found in this type of impaction. A slight excision is indicated on the distal surface, the tooth being directed distally and upward by the application of the exolever to the mesial surface, and the extraction is completed by a buccal application. In Fig. 504 B is shown the occlusal radiogram of the case.

A B

Fig. 504. — Mesioangular Impaction—No Deflection—Mesial Surface Accessible. Same case. *A*, mesial root straight and distal root inclined distally, with ossistructure extending up to gingival third; *B*, occlusal radiogram.

NO DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

A case where the third molar is impacted in a mesioangular position, with the buccal and lingual surfaces in alignment with the corresponding surfaces of the second molar, and where the mesial

surface is inaccessible to the application of the exolever does not occur so frequently as where the mesial surface is accessible. Where the mesial surface is inaccessible, the impaction of the tooth will not be observed clinically, as seldom any part of the crown is exposed.

CLINICAL EXAMINATION

Exposed Crown.—As a rule no part of the crown is exposed, but, should there be any exposure, it will be the distoclusal surface or a part of the distal surface.

Gum Tissue.—The entire tooth is usually covered by gum tissue.

RADIOGRAPHIC INTERPRETATION

Crown.—The radiogram shows a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. There is no overlap of the occlusal or mesial surface of the third molar upon the distal surface of the second. The contact between the first and second molars shows no overlap. The mesial surface is at various distances below the superior border of the ossistructure, and is inaccessible to the immediate application of the exolever.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root straight, 10; mesial root inclined distally and distal root inclined mesially, 8; mesial root straight and distal root inclined mesially, 7; both roots straight, 5; fused roots, 5; both roots inclined distally, 3; hypercementosed roots, 2, and partially developed roots, 2.

Ossistructure.—The position of the mesial surface, in its relation to the superior border of the ossistructure, will interfere with the immediate application of the exolever to this surface, and excision is indicated in order to gain access with this instrument. The greater part of the buccal surface is usually covered by ossistructure, and on the distal surface the ossistructure extends from the gingival third to the occlusal surface. Ossistructure may occasionally be present between the occlusal surface of the third molar and the distal surface of the distal root of the second, and it may be over the buccal half of or the entire occlusal surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—As the gum tissue usually extends over the entire crown, the incision should conform to the excision that is to be made of the ossistructure on the mesiobuccal, distal and buccal surfaces. The first incision is made at the gingival border

on the distobuccal surface of the second molar, and is extended downward to a point where the operator contemplates excising the ossistructure on the mesiobuccal surface of the third molar. This incision will furnish a good flap on the buccal surface of the second molar. A second incision is made along the entire or buccal half of the distal surface of the second molar in such a manner that the gum tissue at this point is not injured as the tooth leaves the socket, when a third incision is made distally, following the buccal surface to a point where excision of the ossistructure on the distal and buccal surfaces can be made and where the exolever can be applied to the buccal surface. The incision is similar to that illustrated for a vertical impaction where there is no deflection and where the mesial surface is inaccessible (Fig. 413, page 388).

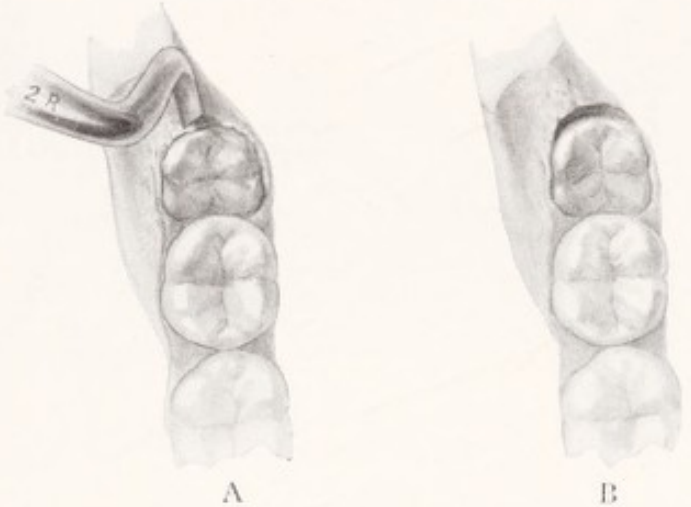


Fig. 505. — Distal Excision of Ossistructure—Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 2R applied to center of ossistructure on distal surface where it extends up to occlusal surface; *B*, extent of excision usually indicated on entire distal surface.

Ossistructure Technic—Distal Excision.—Where the ossistructure on the distal surface of the third molar extends up to the occlusal surface and the alignment of the latter surface is quite a distance from the alignment of the occlusal surface of the second molar, the access for excision, as in a vertical impaction where the occlusal surface of the third molar is quite a distance from the corresponding surface of the second, becomes more difficult. Excision on the distal surface is indicated in almost every case, and should be sufficient, where both roots are curved distally or the mesial root is inclined distally and the distal root is straight, to allow the exolever movements to direct the tooth distally far enough to overcome the resistance of the roots and septum between them. In some cases the ossistructure on the distal surface is slightly involved by a pathologic condition. The excision is made with ossisector No. 2L or 3L for the left side or No. 2R or 3R for the right side, as described on page 467. The gum tissue over

the occlusal surface and on the distal surface is displaced with the blade, and the blade is directed to a slight extent distally to the part to be excised (Fig. 505 A), when the excision is continued until sufficient space is created distal to the distal surface to permit the tooth to be directed distally as far as may be indicated by the root formation. The excision should free the entire distal surface of ossistructure, so that there will be no resistance at this point (Fig. 505 B).

Where the ossistructure on the distal surface extends up to the occlusal surface and is not involved by any pathologic condition, it will not be practicable in some cases to penetrate the ossistructure with the ossisector mentioned above, and ossisector No. 5L for the left

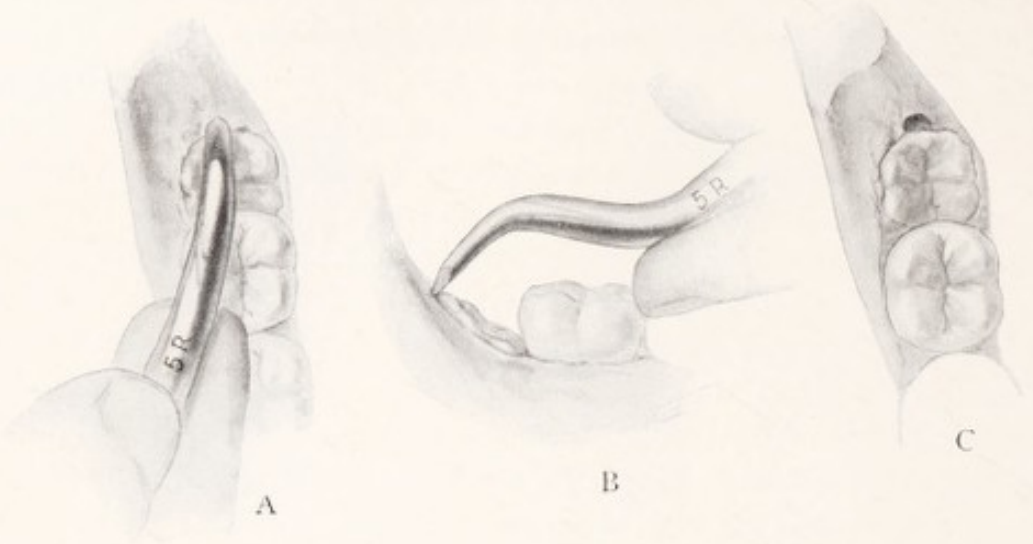


Fig. 506. — Distal Excision of Ossistructure—Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 5R viewed from occlusal, applied to penetrate initially ossistructure where it extends on distal surface up to occlusal surface and cannot be penetrated with ossisector No. 2R; *B*, same application, viewed from buccal; *C*, ossistructure penetrated.

side or No. 5R for the right side is indicated for the initial excision. In an occasional case, instead of the internal oblique ridge being in alignment with the lingual surface of the third molar, it may extend to the center of the distal surface of the third molar, in which case it will be difficult to penetrate the ossistructure on the distal surface. The blade, when initially applied (Figs. 506 A and 506 B) in this type of impaction, should be in alignment with the center of the distal surface, and, after the ossistructure has been penetrated (Fig. 506 C), the excision may be continued with the ossisectors mentioned above. The excision is made similar to that described for a vertical impaction where there is no deflection and the mesial surface is inaccessible (page 388).

Buccal Excision Distal to Bifurcation.—The root formation and position of the tooth, compared with the superior border of the ossistructure, indicate that excision should be made in some cases of this

character on the buccal surface distal to the bifurcation to allow an exolever to be adjusted to this surface. If, however, it is observed that the tooth can be raised out of its socket, by applying the exolever with pressure to the mesial surface, to a point where the superior border of the ossistructure will not interfere with a buccal application, no excision is indicated. The extent to which the tooth can be directed distally and upward with the exolever will indicate the amount of excision necessary on the buccal surface distal to the bifurcation. The excision may be a continuation of the excision on the distal surface, but it is preferable to make a separate excision on the buccal surface, excising the ossistructure from the occlusal surface down to a point slightly above the bifurcation, so as to allow a buccal application of the exolever. The excision is made with ossisector No. 11L for

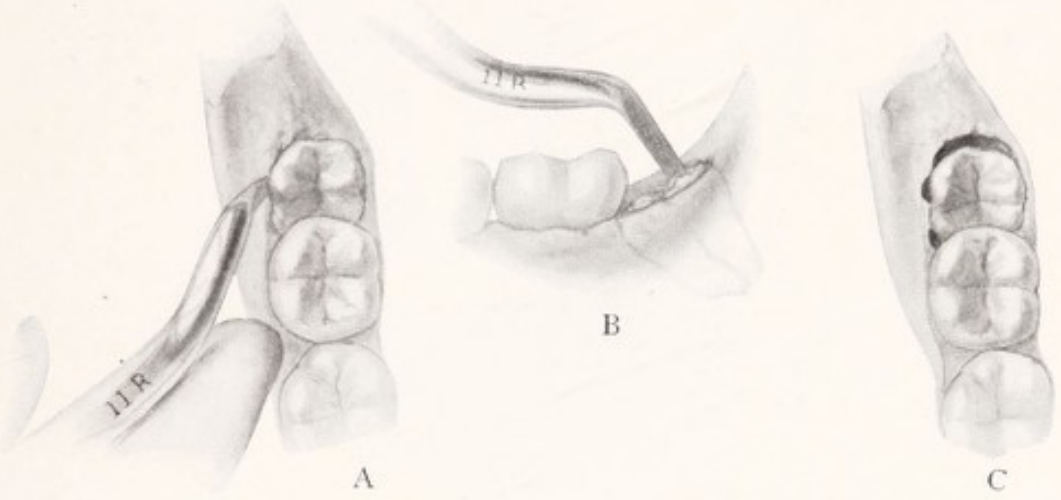


Fig. 507. — Buccal Excision of Ossistructure Distal to Bifurcation—Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 11R, viewed from occlusal, applied for excision on buccal surface distal to bifurcation; *B*, instrument applied, viewed from lingual; *C*, buccal excision distal to bifurcation in addition to distal and mesiobuccal excisions.

the left side or No. 11R for the right side. The gum tissue on the buccal surface is displaced with the back of the blade, and the blade is directed toward the superior border of the ossistructure. The blade is then applied distally to the bifurcation, and, with the blade directed at an angle toward the buccal surface, the excision is started, with pressure under control, toward the tooth (Fig. 507). The excision is continued until there is sufficient space to allow the application of the exolever to the buccal surface after the tooth has been directed distally and upward, but not so far as to destroy an available fulcrum. Often a space is present between the buccal surface and the ossistructure on this surface which will permit the foregoing excision to be readily made. Where the external oblique ridge is in close proximity to the buccal surface, as in the case where the same condition prevails in a vertical impaction, the structure is not so readily penetrated, and

ossisector No. 12L for the left side or No. 12R for the right side is then indicated for penetrating through the ridge, as described for a vertical impaction (page 350).

Mesiobuccal Excision.—Where the ossistructure on the distal surface and, when indicated, on the buccal surface distal to the bifurcation has been excised, additional excision is indicated on the mesiobuccal surface to allow the application of the exolever to the mesial surface. The radiogram is studied to determine the degree of mesioangular inclination of the tooth and the distance of the superior border of the ossistructure from that part of the mesial surface to which the exolever is to be adjusted. When the gum tissue has been incised, a probe or ossisector blade is inserted at the mesioclusal surface to determine whether the buccal surface of the third molar is possibly deflected

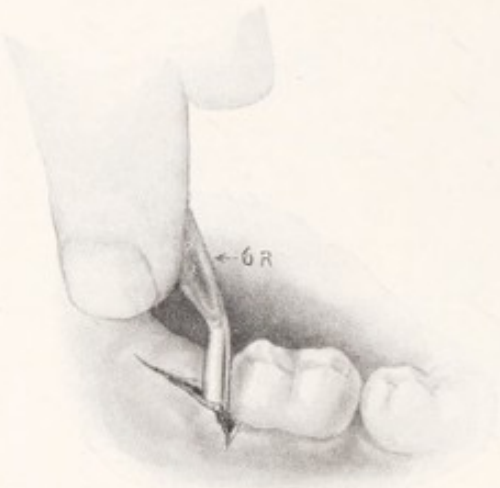


Fig. 508. — Displacing Gum Tissue—Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. Ossisector No. 6R displacing gum tissue on mesiobuccal surface.

buccally out of alignment with the buccal surface of the second. In an occasional case of this kind this condition may be present, and if so, the excision is made on that part of the occlusal or mesial surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second molar, the excision being made in the same manner as in the case of a buccal deflection where the mesial surface is inaccessible (page 512). Where, however, the buccal surface of the third molar is in alignment with the corresponding surface of the second, the approach with the instrument is made from the buccal surface.

The operator makes the excision initially with ossisector No. 6L for the left side or No. 6R for the right side, starting at the superior border of the ossistructure in the region of the mesiobuccal surface and excising down to a short distance above the mesial surface, displacing the gum tissue on the mesiobuccal surface with the back of

the ossisector (Fig. 508). When the blade of the ossisector is being directed down on the mesiobuccal surface, quite often a small space, which could not be discerned in the radiogram, is found between the mesiobuccal surface and the ossistructure on this surface. In case such a space is found and no resistance is presented, the blade of the ossisector is inserted into the space and directed as far as the mesial surface. If it is seen that the exolever blade of a small size can be adjusted to the mesial surface without interference, the ossisector blade is withdrawn and the exolever blade is adjusted. Where the space is not large enough, the ossistructure is excised with the blade

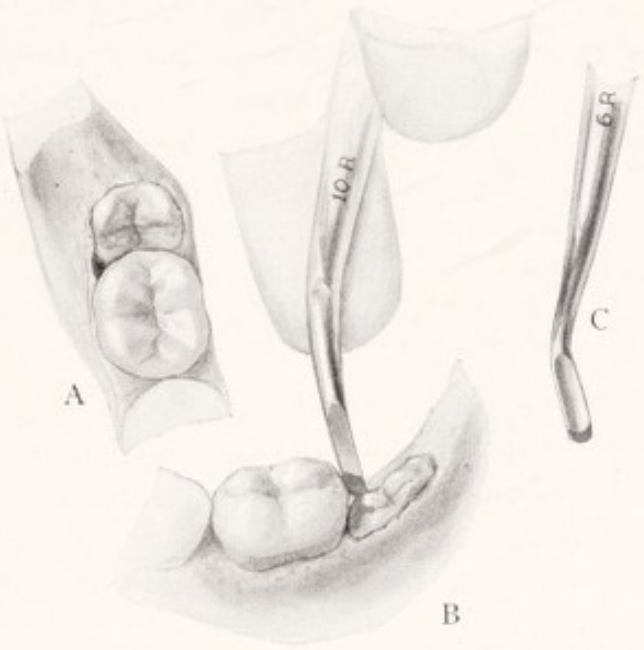


Fig. 509. — Mesiobuccal Excision of Ossistructure—Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. *A*, occlusal view of extent of excision usually indicated on mesiobuccal surface to gain access with blade of exolever; *B*, ossisector No. 10R, viewed from lingual, in position to be applied to mesiobuccal surface to excise ossistructure on this surface in order to obtain access for blade of exolever; *C*, blade and part of shank of ossisector No. 6R used as a pathfinder to locate mesiobuccal surface and any space that may be present between mesiobuccal surface and ossistructure at this point.

of the ossisector toward the mesiobuccal surface to a point where the exolever blade can be adjusted below the mesial surface. If, however, no such space is found, excision of the ossistructure is made down to a short distance above the mesial surface. This excision is executed with ossisector No. 10L for the left side or No. 10R for the right side by directing the blade toward the mesiobuccal surface (Fig. 509), and excising with direct pressure toward this surface, care being taken not to endanger the distal root of the second molar. The blade of the ossisector is small, and the amount of ossistructure excised is limited to the size of the exolever blade to be adjusted to the mesial surface. Where there is a pathologic condition below the mesial surface the involved area often makes the case appear accessible, but the ossistructure in this region often extends quite a distance on the mesiobuccal

surface, and the operator should approach the mesial surface by excising the ossistructure on the mesiobuccal surface as if there were no involvement below the mesial surface.

No excision of the ossistructure should be made below the mesial surface, as this would decrease the value of the structure as a fulcrum at this point. Where there is an interseptum between the second and third molars, the excision is made on the mesiobuccal surface similar to that where the same condition exists in a vertical impaction (Fig. 415, page 390) and the exolever technic for a mesiobuccal application as described for a vertical impaction follows (page 368).

Where the roots are fused, or are of some other formation, but not of large size, the initial application of the ossisector blade with pressure between the mesiobuccal surface and the ossistructure on this surface creates a wedge, when excising at this point, and will often be sufficient to direct the tooth out of its socket or loosen it to such an extent that the adjustment of the exolever to the buccal surface at the bifurcation is all that is necessary to complete the extraction.

Occlusal Excision.—In the cases shown in Fig. 522, page 497, there is ossistructure between the occlusal surface of the third molar and the distal root of the second, and excision of this ossistructure is indicated in advance of the excision of the ossistructure on the mesiobuccal surface of the third molar. There is usually no difficulty in excising this ossistructure, as it is of a cancellous nature, and ossisector No. 8L for the left side or No. 8R for the right side is selected. The gum tissue over the occlusal surface is displaced with the back of the blade, and the blade is directed between the occlusal surface of the third molar and the distal surface of the distal root of the second (Fig. 510). The blade follows the occlusal surface, and, with pressure exerted on the handle, the structure between these two teeth is excised.

Where the roots are partially developed and the ossistructure extends over the buccal fourth or half of the occlusal surface, excision of this ossistructure is indicated before any excision is made on the mesiobuccal, distal or buccal surface. This excision is made with ossisector No. 8L or 9L for the left side or No. 8R or 9R for the right side. The gum tissue over the occlusal surface is displaced with the back of the blade, and, with pressure under control, excision is readily executed, as the ossistructure is not dense and there is a space between the occlusal surface and the superior border of the ossistructure. The excision is made in the manner described for a vertical impaction where there is no deflection and the mesial sur-

face is inaccessible (Fig. 416, page 391). Where the ossistructure is over the buccal half of the occlusal surface the ossisector, when applied, should be kept in alignment with the angular position of the occlusal surface. In this type of case the ossistructure may extend over the lingual fourth or half of the occlusal surface and is excised as described on page 531.

Any small ledge that may remain over the occlusal surface will interfere with the object of the procedure, and the ossisector is applied entirely around this surface in order that no part of the ossistructure may remain.

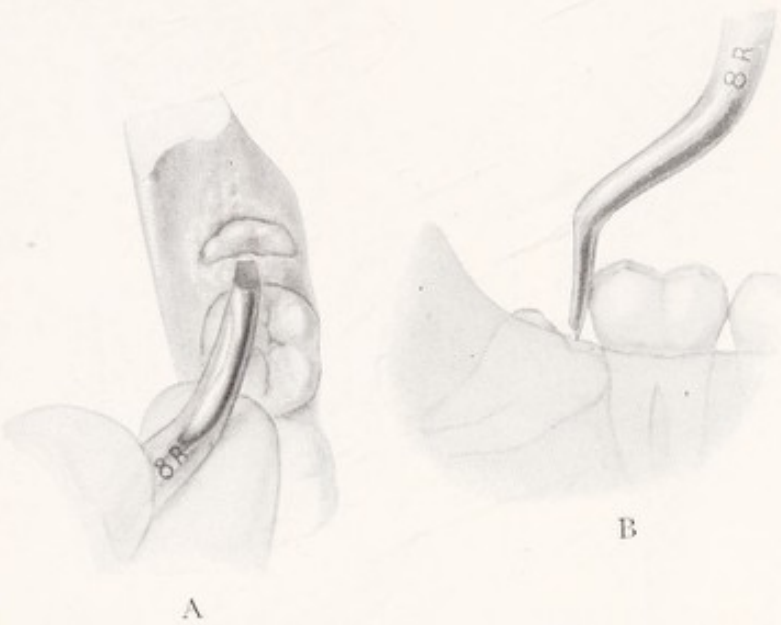


Fig. 510. — Occlusal Excision of Ossistructure—Mesioangular Impaction —No Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 8R, viewed from occlusal, applied for excision of ossistructure between occlusal surface of third molar and distal root of second; *B*, application of instrument, viewed from buccal.

Exolever Technic—Mesial Application.—When the ossistructure on the mesiobuccal, distal and buccal surfaces, and over the occlusal surface, when indicated, has been excised, the exolever is applied to the mesial surface of the third molar, which surface is often quite a distance from the occlusal surface of the second molar. An exolever with a very small blade and with a shank specially designed to gain access (No. 2L for the left side or No. 2R for right side) is used. The instrument is applied along the mesiobuccal surface (Fig. 511), the gum tissue being displaced with the back of the blade. When the blade has reached the mesial surface, the handle is then directed buccally and the blade is adjusted to the mesial surface of the third molar, the superior border of the ossistructure being used as a fulcrum. When this adjustment has been made, the handle of the exolever is turned mesially and the tooth is partially raised distally and upward out of its socket, when an exolever

of the same design but with a larger blade (No. 3L for the left side or No. 3R for the right side) is adjusted to the mesial surface of the third molar and the exolever movements are repeated. The force applied should be sufficient to overcome the resistance of the root formation and the septum between them. When the tooth has been raised out of its socket to a point where the fulcrum is again lost with the instrument mentioned above, exolever No. 4L for the left side or No. 4R for the right side is employed, as the blade is

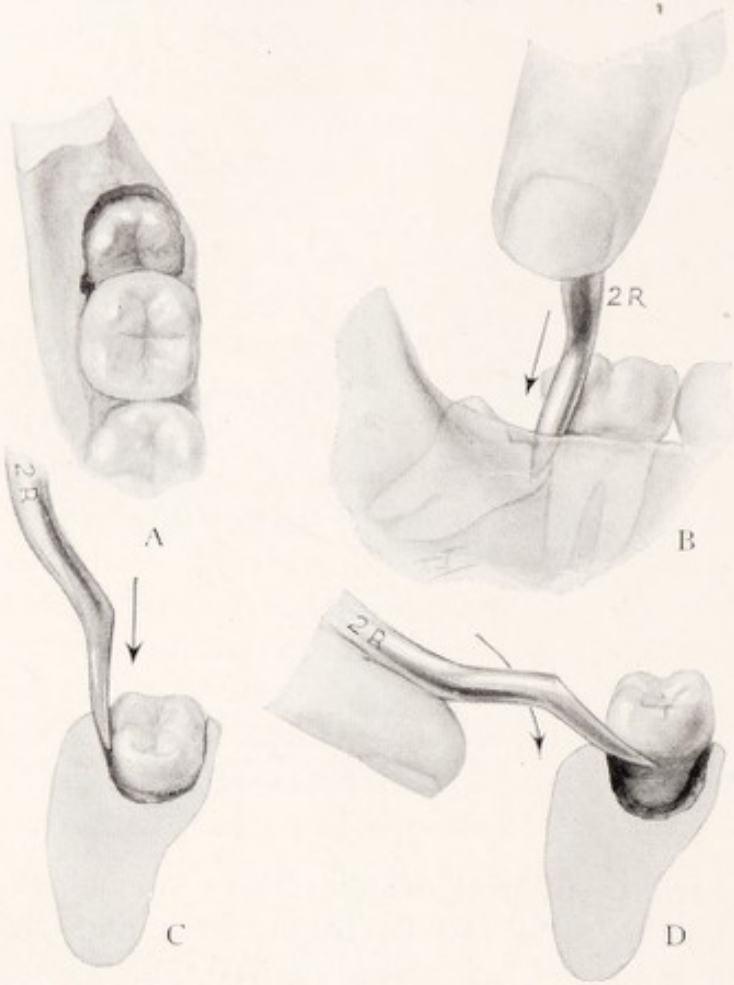


Fig. 511. — Mesial Application of Exolever—Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. *A*, excision on distal and mesiobuccal surfaces; *B* and *C*, exolever No. 2R applied in alignment with mesiobuccal surface in order to be directed below mesial surface; *D*, handle directed buccally in order to apply blade below mesial surface and tooth directed distally and upward.

larger and a better fulcrum can be obtained. The foregoing procedure is like that described for a mesioangular impaction where there is no deflection and the mesial surface is accessible (Fig. 489, page 471).

Where the root formation indicates that the tooth is not to be directed completely out of the socket by the application of the exolever to the mesial surface, it is then directed distally and upward out of its socket to a point where it has cleared the distal surface of the second molar, and a buccal application can be made to com-

plete the extraction. When the blade of the exolever is applied and there is only a short distance between the mesial surface and the superior border of the ossistructure, the wedge created is often sufficient to loosen or extract the tooth. As the distance between the mesial surface and the superior border increases, more difficulty will be encountered in executing the exolever technic. The fulcrum is improved by increased excision in the location of the mesiobuccal surface, but not so far as to impair the use of the ossistructure as a fulcrum.

Buccal Application.—When the exolever movement to direct the tooth distally and upward by a mesial application has been made and the root formation indicates a buccal application, this application is made with exolever No. 10L for the left side or No. 10R for the right side. The point of the blade is directed on the buccal surface toward the bifurcation of the roots, and is sent down on this surface with considerable pressure to act as a wedge between the buccal surface and the ossistructure on this surface. If the wedge fails to raise the tooth out of its socket, the handle of the exolever is pressed downward, which movement will cause the point of the blade to engage the tooth at the bifurcation, with the back of the blade resting on the ossistructure on the buccal surface. The handle of the exolever is then turned to a slight extent buccally to complete the extraction, as illustrated in Fig. 490, page 472.

SUMMARY OF CASES

In the cases shown in Fig. 512, where the mesial root is inclined distally and the distal root is straight, the tooth cannot be extracted by the application of the exolever to the mesial surface, for the pur-

Fig. 512. — Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root straight, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces.

pose of directing the tooth distally and upward to a point where a buccal excision can be avoided, and excision is made on the mesiobuccal surface, on the buccal surface distal to the bifurcation and on the distal surface. An exolever movement is made to direct the tooth distally far enough to overcome the curvature of the mesial

root, but not so far as to cause a fracture of the straight distal root and the extraction is completed by a buccal application.

In the cases shown in Fig. 513, where there is a variation in the root formation, the pathologic condition below the mesial surface makes the case appear as if this surface were accessible. When, however, an exolever is adjusted to the mesiobuccal surface to reach the mesial surface, the progress of the instrument is often stopped by the superior border of the ossistructure interfering with the access of the blade, and in such a case excision is made on the mesiobuccal surface to allow the application of the exolever to the mesial surface. The pathologic condition has weakened the struc-

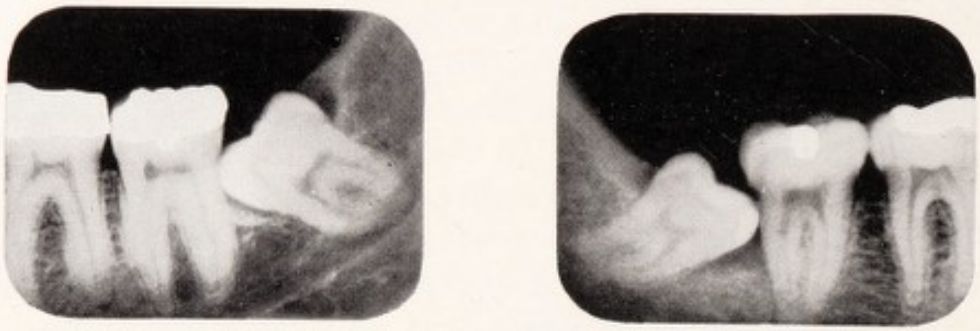


Fig. 513. — Mesioangular Impaction—No Deflection—Mesial Surface Inacccessible. Roots varied in formation, with ossistructure below mesial surface involved by a pathologic condition, which also involves distal, lingual and buccal surfaces.

ture so as to decrease the pressure necessary for the excision. Excision is indicated on the distal surface, and the initial application of the exolever to the mesial surface should be final, as repeated applications will further break down the involved ossistructure below the mesial surface and complicate the case by placing the fulcrum quite a distance from the mesial surface. When a pathologic condition involves the ossistructure on the buccal surface, excision is indicated on this surface distal to the bifurcation to improve the fulcrum. The extraction is completed by a buccal application.

In the cases shown in Fig. 514 the roots are partially developed, and the close contact of the mesial surface of the third molar with

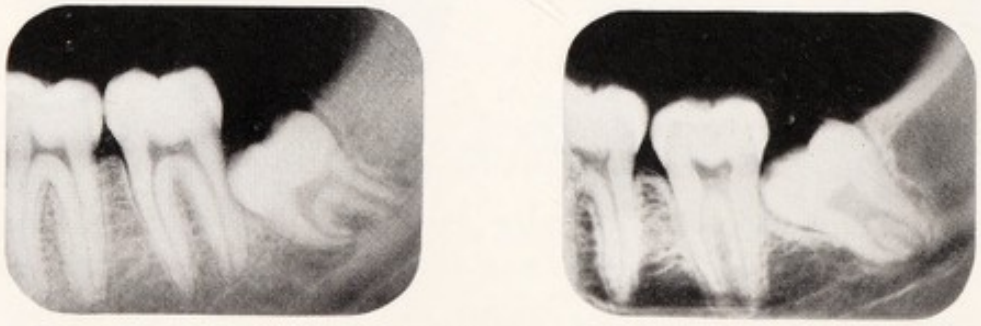
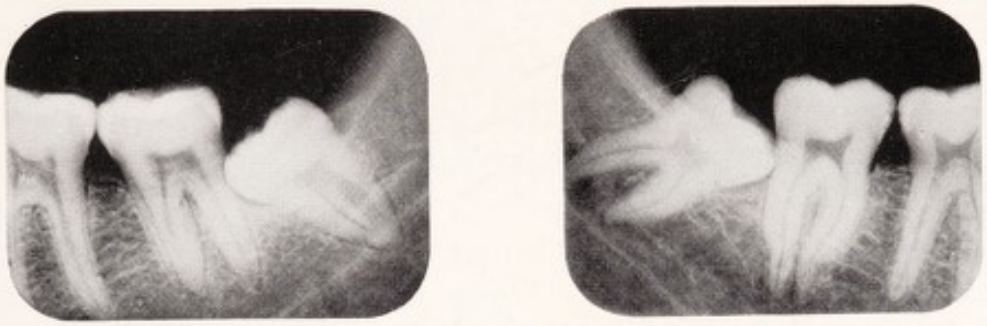


Fig. 514. — Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. Roots partially developed, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces.

the gingival third of the second indicates extraction of the impacted tooth before the pressure of this tooth involves the distal root of the second molar. The technic is executed like that described for the cases shown in Fig. 512.

In the case shown in Fig. 515 A, where the roots are fused, no excision on the distal surface is indicated, as a pathologic condition has created sufficient space to obviate excision. No excision on the buccal surface distal to the bifurcation is indicated, as the tooth, when directed distally and upward by the application of the exolever to the mesial surface, can be directed to a point where the superior border of the ossistructure will not interfere with a buccal application. Excision on the mesiobuccal surface is indicated in order to gain access to the mesial surface.



A B

Fig. 515. — Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. *A*, roots fused, with pathologic condition slightly involving ossistructure on distal surface. The ossistructure extends over entire mesial surface and part of lingual and buccal surfaces. *B*, mesial root inclined to slight extent distally and distal root straight, with large septum between them. The ossistructure on distal surface extends slightly beyond gingival third, over entire mesial surface and over part of lingual and buccal surfaces.

In the case shown in Fig. 515 B, where the mesial root is inclined to a slight extent distally and the distal root is straight, with a large septum between them, the tooth should not be directed too far distally, by the application of the exolever to the mesial surface to overcome the slight distal curvature of the mesial root, as there is a liability of fracturing the distal root, and dependence should be placed on a buccal application to complete the extraction after the tooth has cleared the distal surface of the second molar. Excision on the distal surface, although a part of this surface is free of ossistructure, is indicated on account of the character of the root formation. Excision on the mesiobuccal surface is indicated to gain access to the mesial surface, but no excision is indicated on the buccal surface.

In the cases shown in Fig. 516, where the roots are fused and the ossistructure, which extends on the distal surface up to the occlusal surface, is slightly involved by a pathologic condition, an extensive excision on this surface is not indicated, only sufficient

excision being made to permit the tooth to be directed distally and upward. A slight excision on the mesiobuccal surface is made to secure an adjustment of the exolever to the mesial surface, and no excision is indicated on the buccal surface distal to the bifurcation in order to make a buccal application. Not a great deal of resistance will be encountered when directing the tooth distally and upward with the exolever adjusted to the mesial surface, as the wedge created with the blade will often loosen the tooth, and the movement to direct it distally and upward may raise it out of its socket; but, if this movement does not have this effect, a buccal application is made to complete the extraction. When executing the buccal application, the tooth should be kept under control and not forced lingually into the oral cavity.

Fig. 516. — Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. Roots fused. The ossistructure extends over entire mesial, distal, lingual and buccal surfaces.

In the cases shown in Fig. 517, where the mesial root is inclined distally and the distal root is straight, quite extensive excision is made on the distal surface, where the ossistructure is slightly involved by a pathologic condition, so that the tooth may be directed distally and upward to a point that will obviate excision on the buccal surface. Excision to gain access to the mesial surface in the region of the mesiobuccal surface will not be extensive, as the mesial surface is not located very far below the superior border of the ossistructure. Considerable pressure should be exerted on the

Fig. 517. — Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root straight. The ossistructure on distal surface, which is slightly involved by a pathologic condition, extends beyond gingival third, over entire mesial surface and over greater part of lingual and buccal surfaces.

initial application of the exolever to direct the tooth distally and upward to a point where a buccal application can be made to complete the extraction.

In the cases shown in Fig. 518, where the mesial root is inclined distally and the distal root is inclined mesially, with a septum between them, the ossistructure on the distal surface is involved by a pathologic condition, but not to such an extent as to obviate excision, but no excision is indicated on the buccal surface distal to the bifurcation. In order to gain access to the mesial surface, excision on the mesiobuccal surface is indicated, and, although the space along the mesial surface has the appearance of being accessible, no dependence should be placed on this space, as the mesial surface is below the superior border of the ossistructure. Excision on the mesiobuccal surface can be readily made, as the ossistructure in this region is usually affected by a pathologic condition. When executing the exolever movements distally and upward by the application of pressure to the mesial surface, sufficient force is applied on the initial application to overcome the resistance of the septum between the roots, and, when the tooth has been directed distally and upward, the exolever is applied to the buccal surface at the bifurcation to complete the extraction.

Fig. 518. — Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially. The ossistructure on distal surface, which is involved by a pathologic condition, extends up to occlusal surface and over entire mesial, lingual and buccal surfaces.

In the cases shown in Fig. 519 the condition is entirely different from that shown in Figs. 517 and 518, as only a slight pathologic involvement is present on the distal surface, and the location of the

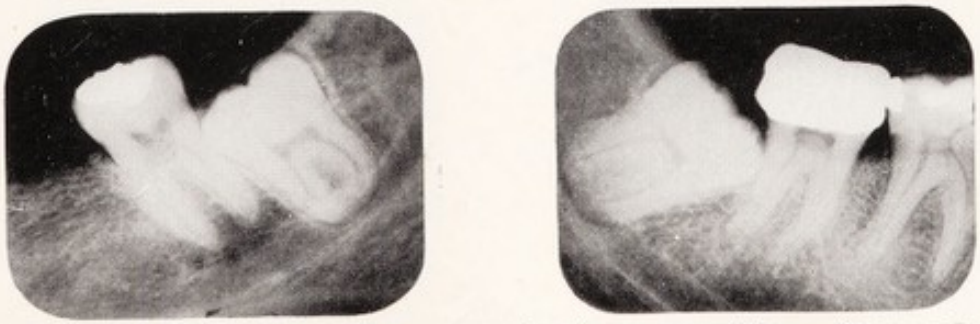


Fig. 519. — Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces.

bifurcation and the size of the roots indicate excision on the mesiobuccal surface, on the buccal surface distal to the bifurcation and on the distal surface. When the exolever is adjusted to the mesial surface, considerable resistance will be encountered in fracturing the septum between the roots, and, after the tooth has been loosened and directed to a distance where it has cleared the distal surface of the second molar, a buccal application is made to complete the extraction.

In the cases shown in Fig. 520, where the mesial root is straight and the distal root is inclined mesially, and where the roots are large, extensive excision is indicated on the distal surface on account of the size of the roots and the septum between them. As a buccal application is indicated, excision is made also on the buccal surface distal to the bifurcation and on the mesiobuccal surface, which excision is made to a point a short distance above the mesial surface, but should extend far enough to permit the exolever to be adjusted to the latter surface. The tooth is directed distally to a point where a buccal application can be made to complete the extraction.

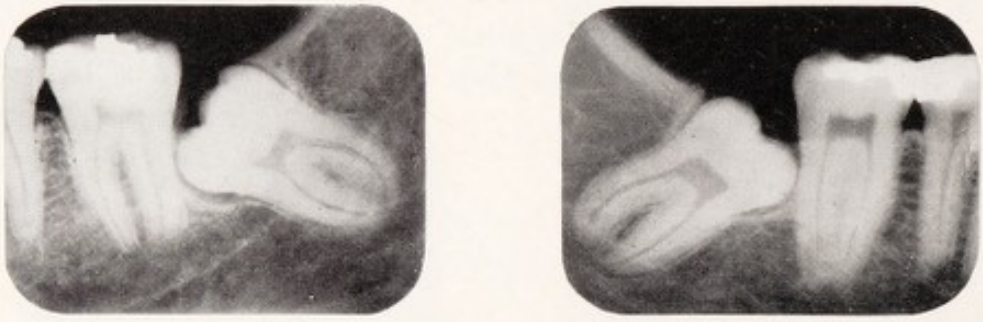


Fig. 520. — Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. Mesial root straight and distal root inclined mesially, both roots being large. The ossistructure extends over entire mesial, distal, lingual and buccal surfaces.

In the cases shown in Fig. 521 there is a variation in the root formation, with the ossistructure extending on the entire mesial, distal, lingual and buccal surfaces, and excision is indicated on the distal and mesiobuccal surfaces. There is quite a large interseptum between the

Fig. 521. — Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. There is a variation in root formation, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces. There is a large interseptum between mesial surface of third molar and distal root of second.

second and third molars which will interfere with the progress of the exolever on the mesial surface if an attempt is made to make the adjustment of the exolever to this surface.

Excision is made on the mesiobuccal surface, as described for a vertical impaction where the mesial surface is inaccessible (page 389), to provide access for exolever No. 9L or 9R, which is indicated for a vertical type of impaction. The exolever technic is executed in the same manner as that described for a mesiobuccal application of the exolever, vertical impaction (page 368).

In the cases shown in Fig. 522, where there is a variation in the root formation in addition to the ossistructure extending on the entire mesial, distal and buccal surfaces, there is ossistructure between the occlusal surface of the third molar and the distal surface of the distal root of the second molar, which is excised before the excision is made on the surfaces mentioned above. This excision is not difficult to make, as the ossistructure between the two teeth is cancellous and is readily broken down with an ossisector. If the ossistructure over the occlusal surface is permitted to remain, it will interfere with the exolever technic, which is executed in conformity with the root formation.

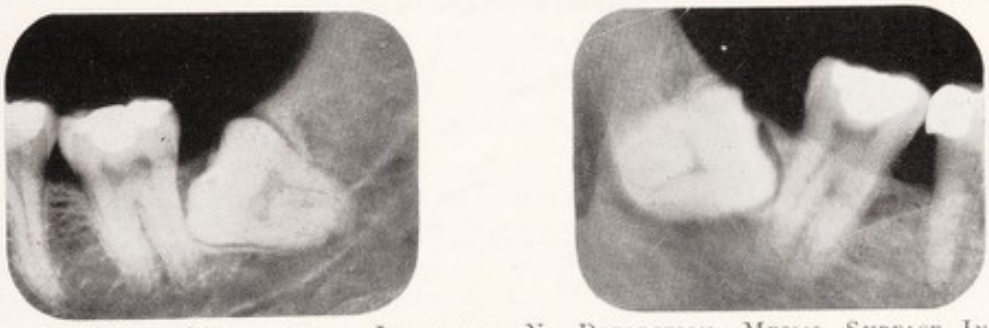


Fig. 522. — Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. There is a variation in root formation, with ossistructure between occlusal surface of third molar and distal root of second, and over entire mesial, distal, lingual and buccal surfaces.

In the cases shown in Fig. 523, where there is a variation in the root formation in addition to the ossistructure extending on the entire mesial, distal and buccal surfaces, the ossistructure also extends over

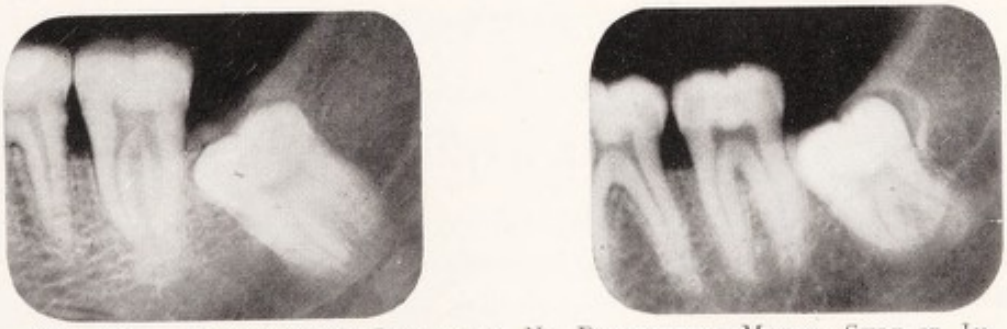


Fig. 523. — Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. There is a variation in root formation, with ossistructure extending over part of occlusal surface, and over entire mesial, distal, lingual and buccal surfaces.

a part of the occlusal surface. The ossistructure over the latter surface is excised in advance of the excising on the surfaces mentioned above. The exolever technic is executed in conformity with the root formation.

In the case shown in Fig. 524, where the roots are hypercementosed, the ossistructure extends on the distal surface beyond the gingival third, over the greater part of the buccal surface, and on the entire mesial surface. Excision is indicated on the distal and mesiobuccal surfaces. When the exolever is applied to the mesial surface to direct the tooth distally and upward, considerable pressure should be applied in order to overcome the resistance of the roots. Where sufficient excision has been made on the distal surface, there should be no hesitancy in directing the tooth distally on account of the root formation. The extraction is then completed by a buccal application.

Fig. 524. — Mesioangular Impaction—No Deflection—Mesial Surface Inaccessible. Roots hypercementosed, with ossistructure extending on distal surface slightly beyond gingival third, over greater part of lingual and buccal surfaces and on entire mesial surface.

BUCCAL DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

Where the mandibular third molar is impacted in a mesioangular position, with the buccal surface of the crown out of alignment buccally with the corresponding surface of the second molar, and with a part of the mesial surface of the third molar free of contact with the distal surface of the second molar, that part of the mesial surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second molar is available for the immediate application of the exolever, the ossistructure anterior to and below this surface being used as a fulcrum.

CLINICAL EXAMINATION

Crown.—The distoclusal surface is usually exposed, and occasionally the entire crown may be exposed.

Gum Tissue.—The gum tissue usually covers a part of the distal surface, it may extend over a part of the occlusal surface and in an occasional case it may be over the entire crown.

RADIOGRAPHIC INTERPRETATION

Crown.—The enamel cap and pulp chamber are distinctly outlined and no part of the occlusal surface is visible. A part of the occlusal or mesial surface of the third molar is in contact with part of the distal surface of the second, and an overlap is shown. The contact between the first and second molars shows no overlap, and the overlap of the third molar upon the second indicates that the third molar is deflected buccally. There is a variation in the location of the contact between the second and third molars, the contact being usually at the gingival third and in some cases slightly above that point.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root straight, 20; mesial root inclined distally and distal root inclined mesially, 15; partially developed roots, 7; both roots straight, 5; both roots inclined distally, 3; mesial root straight and distal root inclined mesially, 3, and fused roots, 2.

Ossistructure.—The amount of ossistructure on the distal surface varies. In some cases the distal surface is free of ossistructure almost to the gingival third, and in other cases the ossistructure extends up to the occlusal surface. A pathologic condition involving the ossistructure below the mesial surface is a common occurrence, but a case where it involves the distal surface is not frequently seen, and pathologic changes occasionally involve the ossistructure on the mesial, distal, lingual and buccal surfaces. The ossistructure on the buccal surface does not, in the majority of cases, interfere with a buccal application. In an occasional case, where both roots are straight, the ossistructure extends on the entire buccal surface, and excision on this surface distal to the bifurcation is indicated on account of the root formation. Excision on the buccal surface distal to the bifurcation is indicated to improve the fulcrum where a pathologic condition involves the ossistructure on the mesial, distal, lingual and buccal surfaces.

OPERATIVE TECHNIC

Gum Tissue Technic.—The extent to which a part of the mesial surface of the crown of the third molar may be deflected buccally out of alignment with the distobuccal surface of the second molar will govern the incision of the gum tissue on the mesial surface. In some cases the gum tissue on the mesial surface of the crown will allow the exolever to be adjusted to this surface without incision and without injury to the gum tissue. Where the deflection is not very marked, the incision is made as in the case where the tooth, in a mesioangu-

lar impaction, is not deflected and the mesial surface is accessible (page 466).

Where an application of the exolever is liable to cause injury to the tissue, the operator makes an incision in line with that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, directing the blade along this surface and incising beyond the buccal surface to allow an application of the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar. A second incision is made from the mesial surface distally along the buccal surface to a point that will permit an excision of the ossistructure on the distal surface and allow the exolever to be applied to the buccal surface (Fig. 525 A). Where no buccal application is indicated, the incision is made along the center of the distal surface, and is extended distally far enough to permit excision of the ossistructure on the distal surface (Fig. 525 B). Where the gum tissue extends over the mesial half of the occlusal surface the incision is made along the tissue over the occlusal surface and is extended buccally. A second incision is then made distally along the buccal surface of the third molar (Fig. 525 C). Where the gum tissue on the buccal half of the distal surface of the second molar interferes with the exolever movements, incision is made on the buccal half of the distal surface of the second molar and is extended to a slight extent buccally beyond that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar. Incision is then made

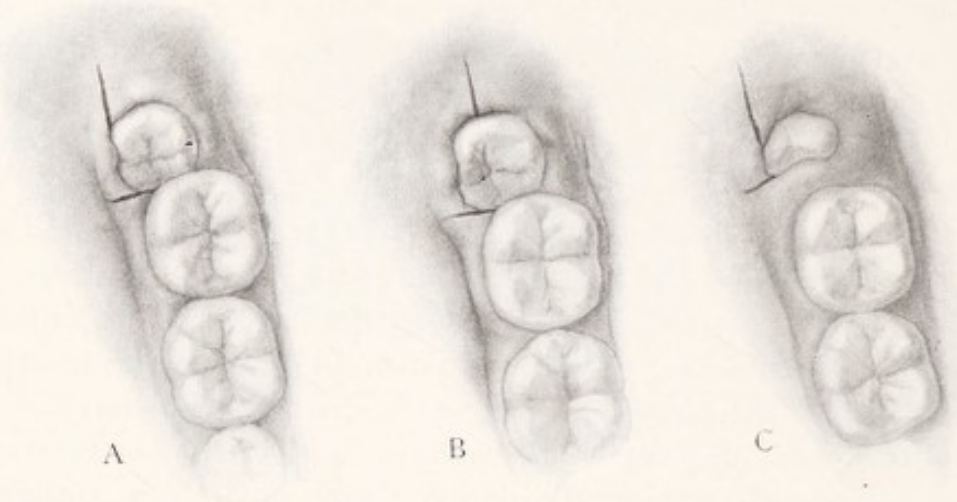


Fig. 525. — Incision of Gum Tissue—Mesioangular Impaction—Buccal Deflection—Mesial Surface Accessible. *A*, incision downward and buccally at that part of mesial surface that is deflected buccally out of alignment with distobuccal surface of second molar, and distally along buccal surface; *B*, incision downward and buccally at mesial surface, distal to center of distal surface; *C*, incision downward and buccally at point where tissue extends over mesial half of occlusal surface and distally along buccal surface.

distally along the buccal surface to a point where the ossistructure can be excised on the distal surface and a buccal application of the exolever can be made. Where a buccal application is not indicated the second incision is made over the occlusal and distal surfaces, the incision being directed distally in alignment with the buccal surface of the second molar. Where the gum tissue extends over the entire tooth, the incision is made as described where there is a buccal deflection and the mesial surface is inaccessible (page 510).

Ossistructure Technic—Distal Excision.—No excision of the ossistructure is indicated in gaining access to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, which is available for the immediate application of the exolever. On the distal surface, where the root formation does not present a great deal of resistance and where the ossistructure does not extend beyond the gingival third,

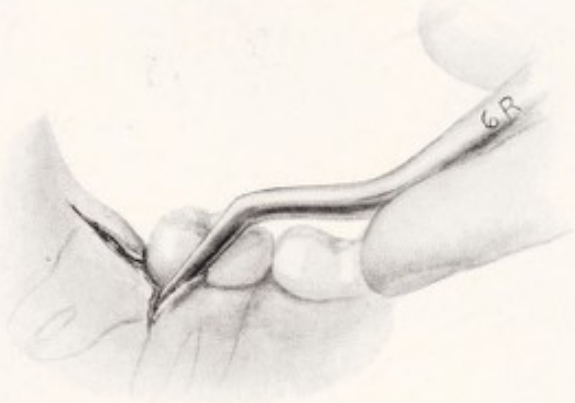


Fig. 526. — Displacing Gum Tissue—Mesioangular Impaction—Buccal Deflection—Mesial Surface Accessible. Exolever No. 6R displacing gum tissue over that part of mesial surface that is deflected buccally out of alignment with distobuccal surface of second molar.

no excision is indicated. Where the root formation is of such a character that great resistance may be encountered, excision on the distal surface is indicated. Ossisector No. 2L or 3L for the left side or No. 2R or 3R for the right side is selected, and the gum tissue over the occlusal surface, if present, is displaced with the back of the blade, when the blade is directed toward the distal surface, displacing the gum tissue on this surface. The point of excision and the amount of ossistructure to be excised having been determined, the blade is directed, with pressure under control, toward the distal surface, and excision is continued until the tooth has been freed of ossistructure down to the gingival third. When excising on the distal surface, the excision is made in alignment with this surface, as described for a mesioangular impaction where there is no deflection (page 467).

Buccal Excision.—In the majority of cases no excision is indicated

on the buccal surface in order to obtain a secure fulcrum unless a pathologic condition has involved the ossistructure on the mesial, distal, lingual and buccal surfaces. Where both roots are straight and the ossistructure extends over the entire buccal surface, the buccal excision is made as described for a mesioangular impaction where there is no deflection (page 484).

Exolever Technic—Mesial Application.—When the incision of the gum tissue is being made for the application of the exolever to that

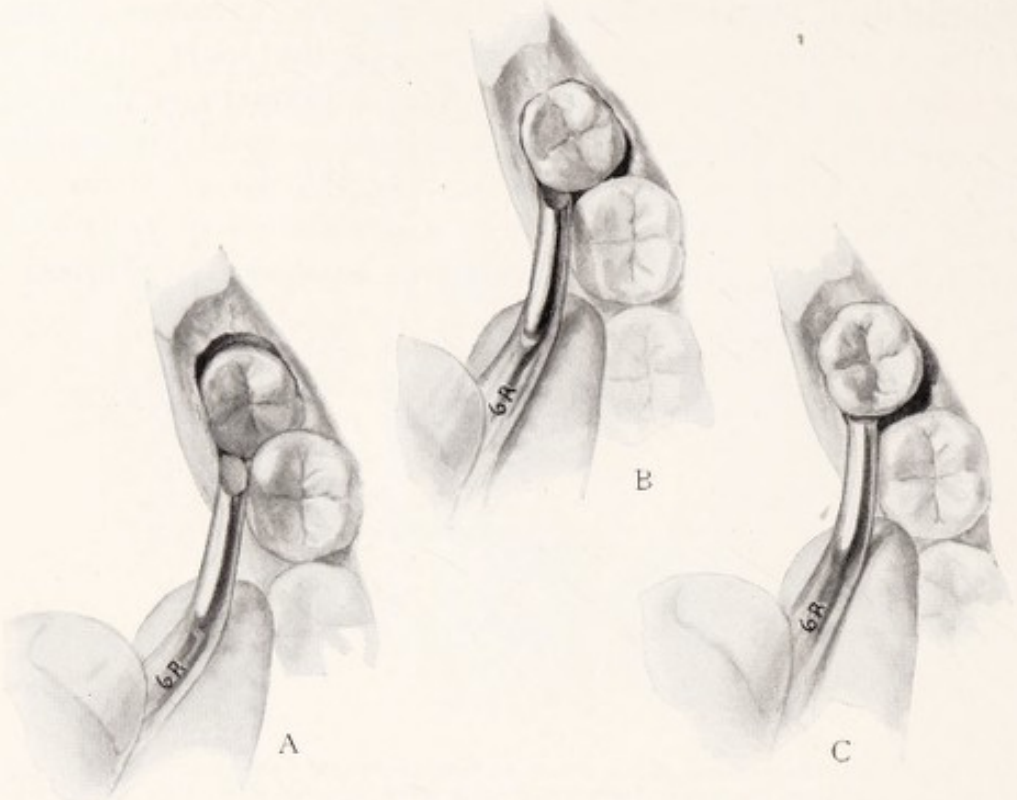


Fig. 527.—Mesial Application of Exolever—Mesioangular Impaction—Buccal Deflection—Mesial Surface Accessible. *A*, exolever No. 6R applied to that part of mesial surface that is deflected buccally out of alignment with distobuccal surface of second molar; *B*, blade wedged between mesial surface and ossistructure directing tooth distally and upward; *C*, tooth directed farther distally and upward to a vertical position where it has cleared distal surface of second molar and where extraction can be completed by directing tooth farther upward and distally or by a buccal application.

part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, the lancet can also be used as a probe to determine clinically the extent of that part of the mesial surface of the third molar that is deflected buccally from the distobuccal surface of the second molar, and to ascertain to what extent the mesial surface is available for the application of the exolever. When the available mesial surface of the third molar has been determined, and it is found that an exolever can be adjusted to this surface independent of the use of the second molar as a fulcrum, exolever No. 6L or 7L for the left side or No. 6R or 7R for the right side is selected. The gum tissue on the mesial surface is dis-

placed with the back of the blade (Fig. 526), and the blade is sent down on this surface to a point where a secure fulcrum for the exolever can be obtained, when the tooth is directed distally, in conformity with the root formation, to a point where the exolever can be applied for a buccal application. Where there is considerable resistance, the exolever movements are repeated until the tooth is sufficiently loosened to allow a buccal application to be made to complete the extraction. The exolever blade, when adjusted with pres-

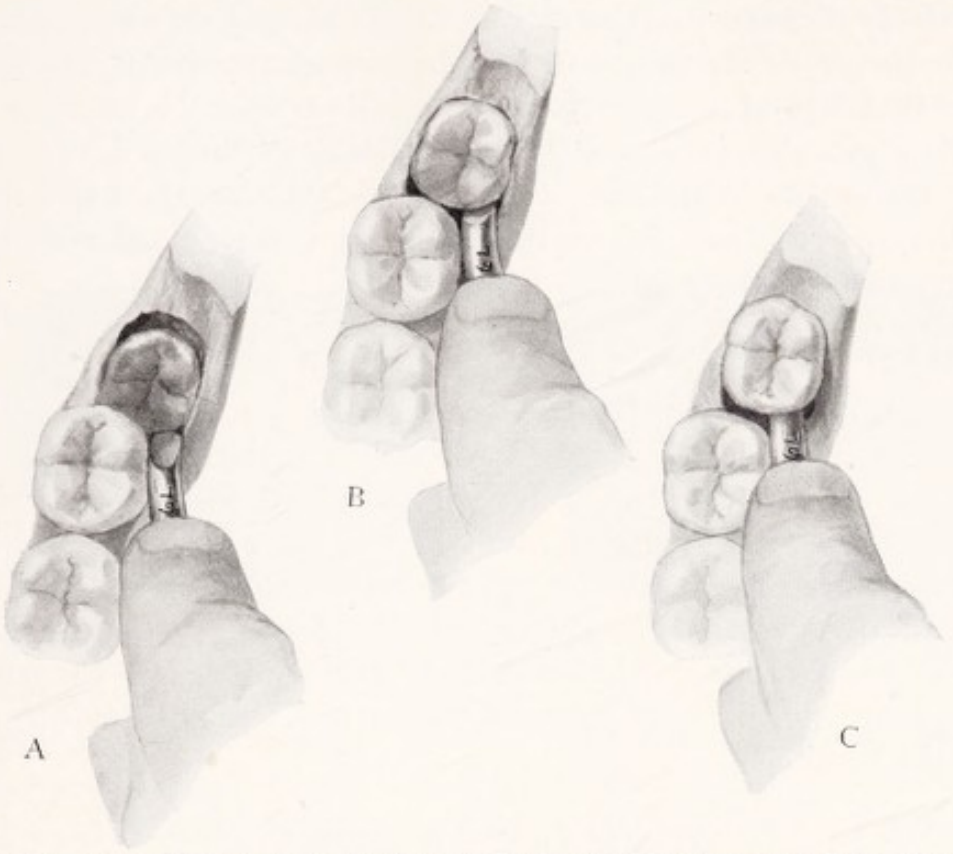


Fig. 528. — Mesial Application of Exolever—Mesioangular Impaction—Buccal Deflection—Mesial Surface Accessible. *A*, exolever No. 6L applied to that part of mesial surface that is deflected buccally out of alignment with distobuccal surface of second molar; *B*, blade wedged between deflected mesial surface and ossistructure, directing tooth distally and upward; *C*, tooth directed farther distally and upward to a vertical position to a point where the contact has cleared distal surface of second molar and where extraction can be completed by directing tooth farther upward and distally or by a buccal application.

sure between that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar and the ossistructure on that surface, creates a wedge sufficient in many cases to extract the tooth. Where the ossistructure is involved by a pathologic condition, the wedge movement should be made so as to avoid repeated applications and further breaking down of the fulcrum, as repeated applications decrease the value of the structure for that purpose. In Fig. 527 A is shown exolever No. 6R applied to that part of the mesial surface deflected buccally out of alignment with the distobuccal surface of the second molar; in Fig. 527 B is shown the blade wedged between the mesial surface

and the ossistructure, directing the tooth distally and upward; in Fig. 527 C is shown the tooth directed farther distally and upward to a vertical position, where a buccal application can be made to complete the extraction; in Fig. 528 is shown the foregoing procedure on the left side.

Where, in executing the technic described above, the adjustment of the exolever to the available mesial surface cannot be made with sufficient firmness, on account of a pathologic condition of the ossistructure or because there is only a small part of this surface accessible, to direct the tooth distally to the extent necessary, the tooth is directed distally far enough to allow exolever No. 2L or 3L for the left side or No. 2R or 3R for the right side to be applied to complete the extraction, as described for a mesial application, mesioangular impaction, where there is no deflection and where the mesial surface is accessible (page 468).

Buccal Application.—When the tooth has been directed distally and upward far enough to be loosened, and has cleared the distal surface of the second molar, exolever No. 10L for the left side or No. 10R for the right side is applied to complete the extraction, as described on page 472. The gum tissue on the buccal surface is displaced with the back of the blade, and the blade is directed into the bifurcation, special care being taken, on account of the alignment of the buccal surface, not to injure the gum tissue. When the adjustment has been secured, the handle of the exolever is turned to a slight extent buccally and pressed downward, which movement will extract the tooth.

SUMMARY OF CASES

In the cases shown in Fig. 529 the mesial root is inclined distally and the distal root is straight, with a pathologic condition of the ossistructure below the mesial surface, and the ossistructure on the distal surface extends up to the gingival third. A slight excision on the distal surface is indicated on account of the character of the root for-

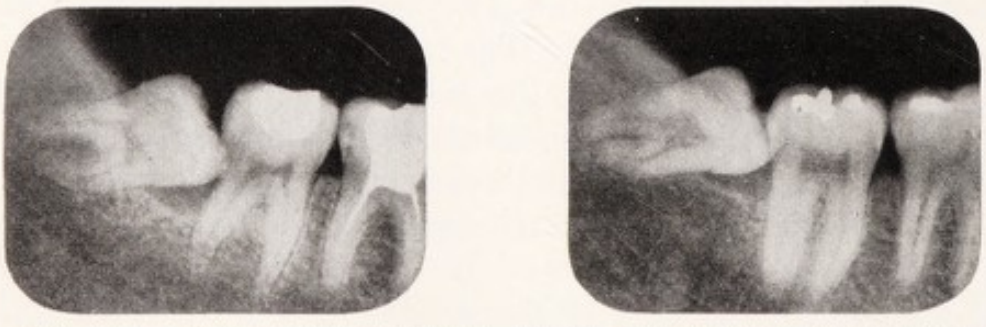


Fig. 529. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with ossistructure on distal surface extending up to gingival third and over part of lingual and buccal surfaces.

mation. An exolever blade can be applied to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to direct the tooth distally and upward. On account of the pathologic condition below the mesial surface, the initial application of the exolever is made with considerable pressure, but not to such an extent as to break down the ossistructure further and lose a good fulcrum. The extraction is then completed by a buccal application.

In the cases shown in Fig. 530, where the mesial root is inclined distally and the distal root is inclined mesially, with a septum between them, a slight excision on the distal surface is made to decrease resistance, and considerable pressure is applied, when directing the tooth distally, to fracture the septum, after which the extraction is completed by a buccal application.

Fig. 530. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially, with ossistructure on distal surface extending up to gingival third and over part of lingual and buccal surfaces.

In the case shown in Fig. 531 A, where the mesial root is inclined distally and the distal root is inclined mesially, with a pathologic condition on the mesial, distal, lingual and buccal surfaces, a slight excision is made on the distal surface to decrease resistance and a second excision is made on the buccal surface distal to the bifurcation to secure a fulcrum. Where a pathologic condition involves the mesial surface to the extent shown, and the tooth is not markedly deflected, the exolever technic to be followed is the same as described where the

A B

Fig. 531. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Accessible. Same case. *A*, mesial root inclined distally and distal root inclined mesially, with a pathologic condition involving ossistructure on mesial, distal and buccal surfaces; *B*, radiogram made after extraction.

buccal surface of the third molar is in alignment with the corresponding surface of the second, and the mesial surface is accessible (page 468), exolever No. 3L or 4L for the left side or No. 3R or 4R for the right side being used. If this procedure is not practicable on account of the greater part of the mesial surface being deflected buccally out of alignment with the buccal surface of the second molar, exolever No. 9L for the left side or No. 9R for the right side is adjusted to the mesiobuccal surface, where a secure adjustment can be obtained. As a pathologic condition has weakened the ossistructure anterior to the mesial surface, the root formation and septum between them indicate that the initial application of the exolever to the mesial or mesiobuccal surface should be made with considerable force to fracture the septum between the roots, but repeated applications of the exolever should be avoided in this procedure. The initial application of the exolever to the mesial or mesiobuccal surface should be final, as repeated applications weaken the fulcrum, and a buccal application is made after the tooth has been directed distally. When making the buccal application, a secure fulcrum cannot be obtained unless the ossistructure on the buccal surface distal to the bifurcation has been excised sufficiently to obtain a fulcrum. In Fig. 531 B is shown a radiogram made of the case after extraction.

Fig. 532. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially, with ossistructure on distal surface extending up to occlusal surface and over greater part of the lingual and buccal surfaces.

In the cases shown in Fig. 532, where the mesial root is inclined distally and the distal root is inclined mesially, with the ossistructure on the distal surface extending up to the occlusal surface, excision on the distal surface is made to the gingival third. No excision on the buccal surface is indicated, as the tooth can be directed distally and upward to a point where the superior border of the ossistructure will not interfere with a buccal application. The ossistructure below the mesial surface is not involved, and will make an ideal fulcrum when the exolever is applied to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar. The tooth is directed distally with considerable force to

fracture the septum between the roots, after which a buccal application of the exolever is made to complete the extraction.

In the cases shown in Fig. 533, where both roots are straight and a pathologic condition has involved the ossistructure on the mesial, lingual, distal and buccal surfaces, a slight excision on the distal surface is indicated to decrease resistance at this point, and a second excision on the buccal surface slightly distal to the bifurcation is indicated to secure a fulcrum. The tooth is directed only to a slight extent distally to obviate a fracture of the roots, and the extraction is completed by a buccal application.

Fig. 533. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Accessible. Both roots straight, with a pathologic condition involving ossistructure on mesial, distal, lingual and buccal surfaces.

In the cases shown in Fig. 534, where both roots are divergent and the ossistructure extends on the distal surface up to the occlusal surface, excision on the former surface down to the gingival third is indicated on account of the character of the root formation, as the tooth cannot be directed very far distally and upward by the application of pressure to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar without causing a fracture of the roots, and such fracture can be avoided by a buccal application. Excision on the buccal surface distal to the bifurcation should be sufficient to insure a proper application of the exolever. The tooth is directed only to a slight extent distally when the exolever is applied to the mesial surface to clear the distal surface of the second molar, and dependence is placed largely on the buccal application of the exolever to complete the extraction.

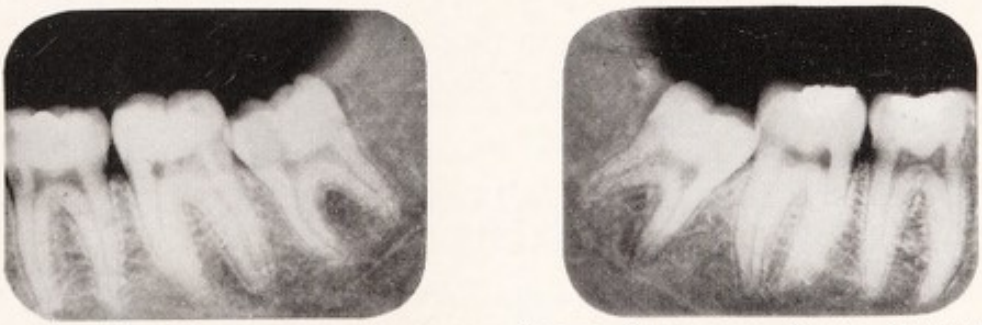
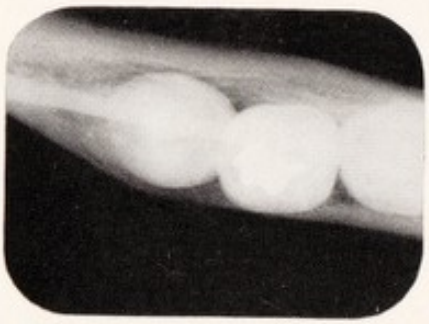


Fig. 534. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Accessible. Both roots divergent, with ossistructure on distal surface extending up to occlusal surface and over entire lingual and buccal surfaces.

In the case shown in Fig. 535 A, where the mesial root is straight and the distal root is inclined to a slight extent mesially, with the ossistructure on the distal surface extending slightly beyond the gingival third and over a part of the buccal surface, a slight excision is made on the distal surface to decrease resistance, but no excision is indicated on the buccal surface. The tooth is directed only to a slight extent distally by the application of the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to clear the distal surface of the

A



B

C

Fig. 535. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Accessible. Same case. *A*, mesial root straight and distal root inclined to a slight extent mesially, with ossistructure on distal surface extending slightly beyond gingival third and over a part of lingual and buccal surfaces; *B*, occlusal radiogram of case; *C*, radiogram made after extraction.

second molar, and the extraction is then completed by a buccal application. Figure 535 B is an occlusal radiogram of the case, which shows only a slight buccal deflection, and Fig. 535 C shows a radiogram of the socket after extraction.

In Fig. 536 are shown two cases for comparison of lingual and occlusal radiograms. Where the gum tissue extends over the entire occlusal surface an occlusal radiogram should be made to determine accurately the degree of deflection.

BUCCAL DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

Where the third molar is in a mesioangular position, with the buccal surface of the crown out of alignment buccally with the corresponding surface of the second molar, and with the mesial surface inaccessible

to the immediate application of the exolever, the position of the tooth is more favorable for excision of the ossistructure in order to adjust the exolever to the mesial surface than in some cases where the buccal surface of the third molar is in alignment with the corresponding surface of the second and the mesial surface is inaccessible. The extent to which the mesial surface of the third molar is below the superior border of the ossistructure is determined, as the depressed position of the tooth will interfere with the ready access of an exolever to the mesial surface. The ossistructure on the occlusal or mesial surface

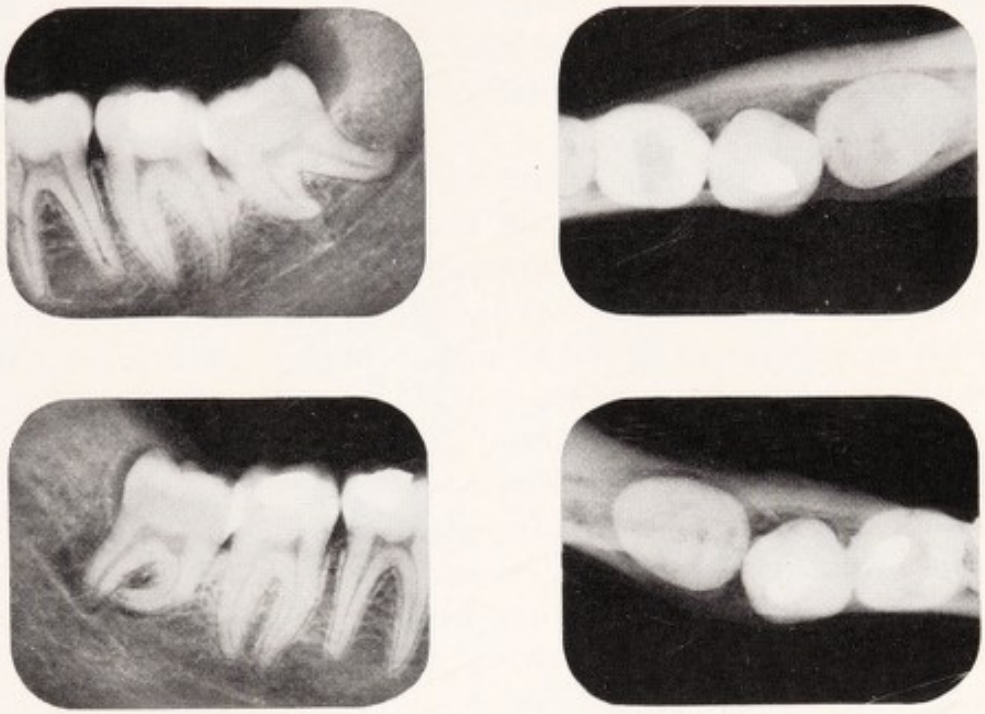


Fig. 536. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Accessible. Two cases where a comparison of lingual and occlusal radiograms can be made of degree of deflection of that part of mesial surface of crown that is deflected buccally out of alignment with distoclusal surface of second molar.

should be specially noted, as it will be an important factor in determining the extent of the excision of the ossistructure necessary in gaining access with an exolever.

CLINICAL EXAMINATION

Exposed Crown.—The crown is usually covered by gum tissue, but occasionally a small part of the distal surface is exposed.

Gum Tissue.—The description above in regard to the exposed crown will apply to the condition of the gum tissue.

RADIOGRAPHIC INTERPRETATION

Crown.—A definite enamel cap and pulp chamber are shown, but no part of the occlusal surface is visible. The occlusal or mesial surface of the third molar is in contact with the distal surface or distal root of the second and shows an overlap, indicating that

there is a buccal deflection of the tooth. The contact between the first and second molars shows no overlap, and these two teeth are examined, the overlap between the second and third molars being checked. The mesial surface is inaccessible to the application of the exolever.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root inclined mesially, 8; fused roots, 8; partially developed roots, 7; both roots inclined distally, 3; mesial root straight and distal root inclined distally, 3; both roots straight, 2; divergent roots, 1, and mesial root inclined distally and distal root straight, 1.

Ossistructure.—The mesial surface is inaccessible, and there is a variation in the distance of the mesial surface from the superior border of the ossistructure. Pathologic changes do not usually involve the ossistructure below the mesial surface, but, when such involvement is present, it is very slight. Where pathologic changes involve the ossistructure on the distal, lingual and buccal surfaces the pathologic area below the mesial surface is usually very extensive. The ossistructure on the distal surface, which is not often involved by a pathologic condition, usually extends beyond the gingival third up to the occlusal surface, but occasionally extends only up to the gingival third. The ossistructure usually extends over the entire buccal surface, and it is extremely rare to find the ossistructure extending over the buccal half of the occlusal surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—The gum tissue is examined with a view to making an incision that will not leave the distal root of the second molar exposed after the third molar has been extracted, but that will at the same time permit access of the ossisector in excising the ossistructure on that part of the mesial surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second molar, so that the exolever may be applied to the latter surface and permit the tooth to be directed distally.

The initial incision is made downward and buccally on the distobuccal surface of the second molar slightly mesial to the distal surface. This incision will allow access for the purpose of excising the ossistructure along that part of the occlusal or mesial surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second, and will avoid displacing the gum tissue on the buccal surface of the second molar anterior to the

incision. The flap is readily replaced and the tissue will not be subject to trauma. A second incision is made distally along the buccal surface where a buccal application is indicated to a point that will permit excision of the ossistructure on the buccal and distal surfaces. A third incision is made along the buccal half of the distal surface of the second molar (Fig. 537 A). Where a buccal application is not indicated, the distal incision of the gum tissue is made distally over the center of the occlusal surface of the third molar in line with the buccal surface of the second (Fig. 537 B).

Ossistructure Technic—Distal Excision.—The ossistructure on the distal surface usually extends beyond the gingival third, and often up to and occasionally over the occlusal surface. On account of the

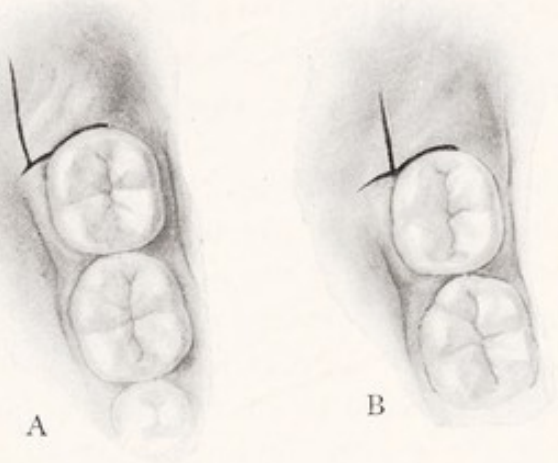


Fig. 537. — Incision of Gum Tissue—Mesioangular Impaction—Buccal Deflection—Mesial Surface Inaccessible. *A*, incision downward and buccally at distobuccal surface of second molar, distally along buccal surface, and on buccal half of distal surface of second molar; *B*, incision downward and buccally on distobuccal surface of second molar, distally along center of occlusal surface, and on buccal half of distal surface of second molar.

tooth being deep-seated, access for excising the ossistructure will be difficult, and the excision is not so readily made as in a case where the tooth is not so deeply embedded.

Excising the ossistructure on the distal surface is the initial procedure, and is executed as described on pages 467, 483. The extent of the excision will be governed by the amount of ossistructure present and the formation of the roots of the third molar. Where both roots are fused, not so much excision of the ossistructure on the distal surface will be necessary as where the roots have a decided distal inclination.

The excision of the ossistructure on the distal surface of the third molar should be sufficient to permit the tooth to be directed distally and upward. Where both of the third molar roots are not decidedly inclined distally, the operator should take advantage of an application of the exolever to the buccal surface to direct the

tooth upward out of its socket to complete the extraction, and thereby decrease the extent of excision of the ossistructure on the distal surface that would otherwise be necessary. The gum tissue over the occlusal surface is displaced with the back of the blade, and this is followed by a displacement of the gum tissue over the distal surface slightly distal to the part to be excised. When the blade has been adjusted to the ossistructure at this point, it is directed, with pressure under control, toward the ossistructure on the distal surface, and repeated excisions in this region may be necessary, as the distal surface cannot be cleared of ossistructure in such a case with one excision, as can be done where the ossistructure is more readily accessible. When excising the ossistructure, the course of the blade is kept in alignment with the distal surface. The external oblique ridge often extends to the center of the distal surface, and, when this condition exists the difficulty of excision is increased.

Distoclusal Excision.—In the case shown Fig. 548 A, page 521, the ossistructure extends over the distoclusal surface and is excised in advance of the ossistructure on the distal surface, which excision is made as in the case where the tooth is in a vertical position and the ossistructure extends over the occlusal surface (page 349).

Occlusal Excision.—The external oblique ridge in an occasional case may extend over the buccal fourth or half of the occlusal surface, which must be excised in advance of the application of the exolever. Excision is made over the buccal fourth or half of the occlusal surface with ossisector No. 2L, 8L or 9L for the left side or No. 2R, 8R or 9R for the right side. The blade is used to displace the gum tissue over the occlusal surface and rests upon the superior border of the ossistructure, and, with pressure under control, is directed toward the occlusal surface. There is usually a space between the superior border of the ossistructure and the occlusal surface, and, as a rule, excision is not very difficult. The excision is continued from the mesial toward the distal surface, or vice versa, and, when the mesial surface has been reached, no excision is made at this point that will decrease the value of the ossistructure as a fulcrum. In. Fig. 538 A is shown ossisector No. 9R applied to the ossistructure over the buccal half of the occlusal surface; Fig. 538 B shows part of the ossistructure excised; Fig. 538 C shows the excision being completed with ossisector No. 2R, which instrument is also used to make the distal excision, and Fig. 538 D shows the completed excision.

Mesial or Mesioclusal Excision.—Excision of the ossistructure, when indicated, is made on the mesioclusal or mesial surface to gain access with the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of

the second molar. This excision is executed with ossisector No. 8L for the left side or No. 8R for the right side. In some cases the excision must be made over a part of the mesioclusal surface before the mesial surface can be made accessible for the exolever, and in these cases several ossisectors of the same design with sharp blades should be available, as the blade is dulled when it comes in contact with the enamel surface.

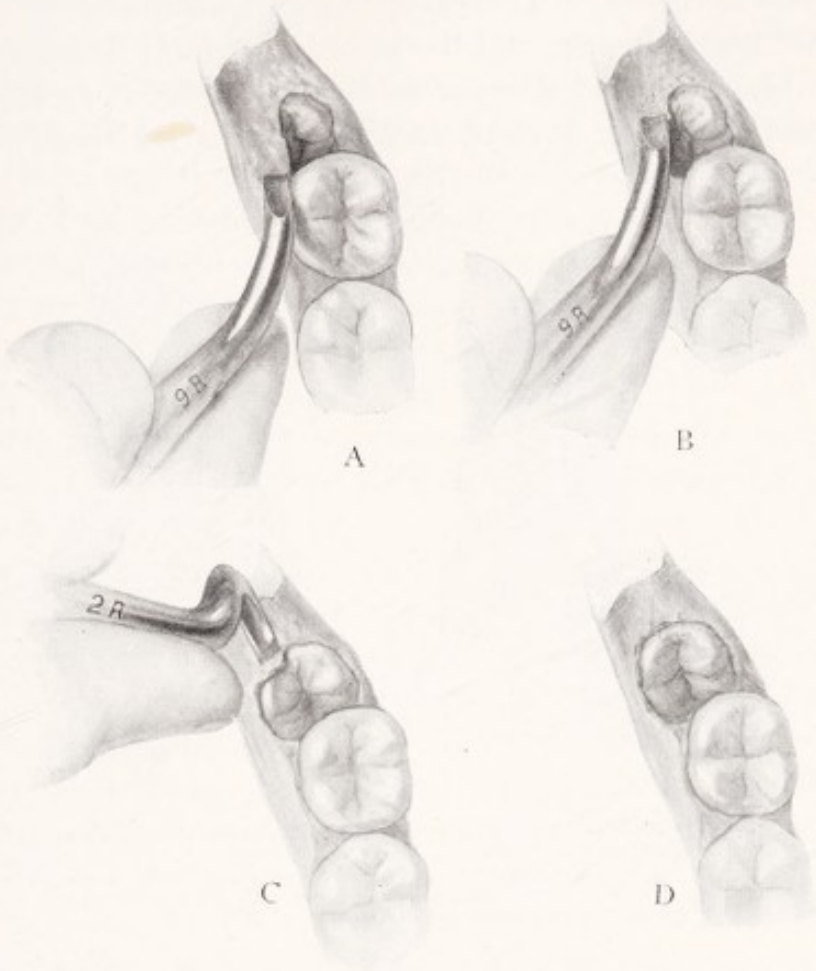


Fig. 538. — Excision of Ossistructure over Buccal Half of Occlusal Surface—Mesioangular Impaction—Buccal Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 9R applied for excision of ossistructure over buccal half of occlusal surface; *B*, continuation of excision distally; *C*, ossisector No. 2R completing excision on distal surface; *D*, tooth when ossistructure has been excised from over buccal half of occlusal surface.

The gum tissue over that part of the mesioclusal surface or mesial surface that is deflected buccally out of alignment with the disto-buccal surface of the second molar is displaced with the back of the blade, and the extent to which part of the mesial surface of the third molar is out of alignment buccally with the buccal surface of the second molar can be approximately determined by the previous displacement of the gum tissue over the occlusal surface. The blade is directed toward the mesioclusal surface or mesial surface, as the case may be, and the excision is continued, with pressure under control,

until the mesioclusal surface is free of ossistructure, the instruments being changed during the procedure as may be necessary. When that part of the occlusal surface not in contact with the second molar has been freed of ossistructure, or where there is no structure over the occlusal surface to be excised, the excision is made toward the mesial surface, and is kept in alignment with this surface. Often a small space is found along the mesial surface, and in that case no excision may be necessary. Too extensive an excision along the mesial surface should not be made, and the excision should be only sufficient to allow the blade of the exolever to be adjusted. An extensive excision will endanger the second molar, and, in addition, will place

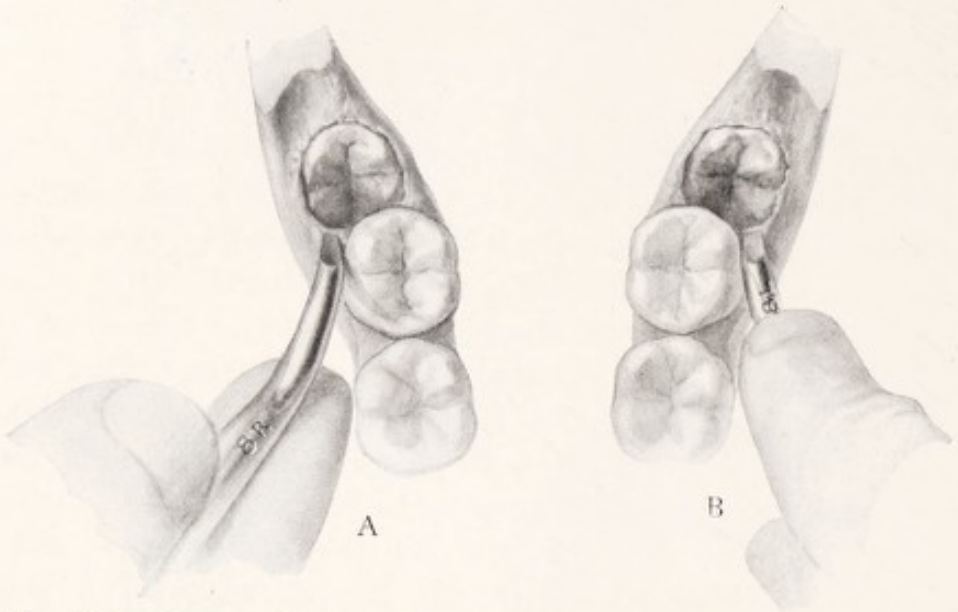


Fig. 539. — Mesial or Mesioclusal Excision of Ossistructure—Mesioangular Impaction—Buccal Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 8R applied for excision on right side to gain access with exolever to that part of mesial surface that is deflected buccally out of alignment with distobuccal surface of second molar; *B*, application of instrument on left side.

the ossistructure to be used as a fulcrum too far from the mesial surface.

In Fig. 539 A is shown the application of ossisector No. 8R for excision on the right side; and in Fig. 539 B is shown the application of ossisector No. 8L on the left side.

Buccal Excision Distal to Bifurcation.—When an examination of the radiogram indicates that, after the excision of the ossistructure on the occlusal, mesial and distal surfaces, the tooth can be directed distally and upward out of its socket to a point where an application of the exolever can be made to the buccal surface to complete the extraction, no excision on the buccal surface will be necessary. Where, however, the tooth cannot, by the application of the exolever to the mesial surface, be directed distally and upward beyond the superior border of the ossistructure to allow an adjustment of the exolever to

the buccal surface at or near the bifurcation, the ossistructure on the buccal surface is excised to a point where, after the tooth has been directed distally to overcome formation of the roots and septum between them, a buccal adjustment can be made. This excision is started at the superior border of the ossistructure distal to the bifurcation, so that, after the tooth has been directed distally, the excision will be in line with the bifurcation. The excision is made as far down as may be necessary, which will only occasionally be as far as a short distance above the gingival third, as the application of the exolever to the mesial surface, which will cause the tooth to be directed distally and upward, will obviate excessive excision of the ossistructure on the buccal surface, and the excision is made as described on page 484.

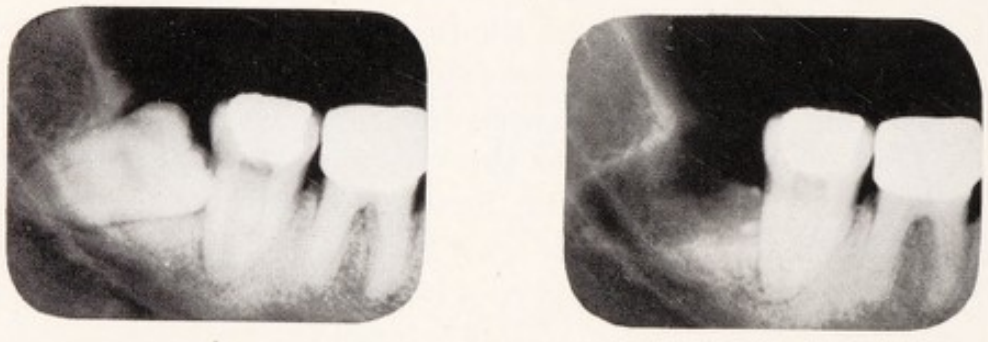
Exolever Technic—Mesial Application.—After the necessary excision of the ossistructure has been made, the exolever is applied to that part of the mesial surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second molar, as illustrated in Figs. 527 and 528, pages 502, 503. Precaution should be taken, when adjusting the instrument, not to come in contact with the distobuccal surface of the distal root of the second molar, especially where there is a fusion of the roots of this tooth. Exolever No. 6L for the left side or No. 6R for the right side is selected, and the gum tissue over the occlusal surface or on the mesial surface is displaced with the back of the blade. The exolever is sent down on that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar with sufficient force to act as a wedge between the mesial surface and the ossistructure on this surface, and this movement will often loosen the tooth. If, however, the tooth has not been loosened by this movement, the exolever is securely adjusted to the mesial surface and the tooth is directed distally by forcing the handle mesially or distally. The extent of the force applied with the exolever will depend on the root formation, and, where the mesial root is inclined distally and the distal root is inclined mesially, with a large septum between them, the initial application to direct the tooth distally is made with considerable force in order to fracture the septum. If resistance is encountered, repeated applications are made by sending the blade farther down on the mesial surface, and directing the tooth distally until the septum between the roots has been fractured and the tooth loosened to such an extent that a buccal application of the exolever can be made to complete the extraction. The ossistructure on the buccal surface is then used as a fulcrum. Where the previously mentioned exolever, when adjusted to the mesial surface, has loosened the tooth and the deflection is only slight, or where there is a pathologic condition and there is not a suitable fulcrum, after the tooth has been loosened

and directed to a distance where the superior border of the ossistructure can be used as a fulcrum, exolever No. 2L or 2R is applied to the mesiobuccal surface and directed below the mesial surface; the external oblique ridge is then used as a fulcrum and the handle of the exolever is turned mesially, and this movement will direct the tooth out of its socket to a distance where a buccal application can be made to complete the extraction.

Buccal Application.—After the tooth has been loosened by applying the exolever to the mesial surface, it is directed distally and upward to a point where a buccal application can be made. If it is found that, in the case where excision has been made for a buccal application, the excision has not been sufficient to allow the application of an exolever, the excision is increased. The technic for excision of the ossistructure on the buccal surface is as described on page 484, and the exolever technic is as described for a buccal application (page 472).

SUMMARY OF CASES

In the case shown in Fig. 540 A, where the roots of the second molar as well as the roots of the third are fused, the ossistructure on the mesial, distal, lingual and buccal surfaces of the third molar is slightly involved by a pathologic condition, and a slight excision on the distal surface is indicated. No dependence can be placed on the involved ossistructure below the mesial surface, and excision is made for access,



A B

Fig. 540. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Inaccessible. Same case. *A*, roots of second molar as well as of third molar are fused, with a slight pathologic condition involving ossistructure on mesial, distal, lingual and buccal surfaces; *B*, case after extraction.

as often a case of this kind has the appearance of being accessible, but, when the exolever is applied, the progress of the instrument is stopped by the superior border of the ossistructure. Excision is, however, readily made, as the pathologic condition has weakened the ossistructure. The adjustment of the exolever to that part of the mesial surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second molar should be made with

caution, so that the instrument may not come in contact with the second molar, as the latter tooth, in case such a contact occurs, may be loosened on account of the fusion of the roots.

In Fig. 540 B is shown a radiogram of the case after extraction, from which a good idea can be formed of the condition of the distal surface of the distal root of the second molar.

In the cases shown in Fig. 541, where the roots of the second molar as well as the roots of the third are fused and the ossistructure on the distal surface extends up to the occlusal surface, an excision of the ossistructure on the distal surface and over the mesioclusal surface is indicated. When the exolever is applied to that part of the mesial surface that is deflected buccally out of alignment with the buccal surface of the second molar, no such resistance will be encountered as would be the case if the roots were not fused. Occasionally, in a case of this kind, the tooth can be extracted by a mesial application of the exolever, but no dependence can be placed on such an application to complete the extraction, as in the majority of such cases, on account of the depressed position of the tooth, a buccal application of the exolever is necessary.

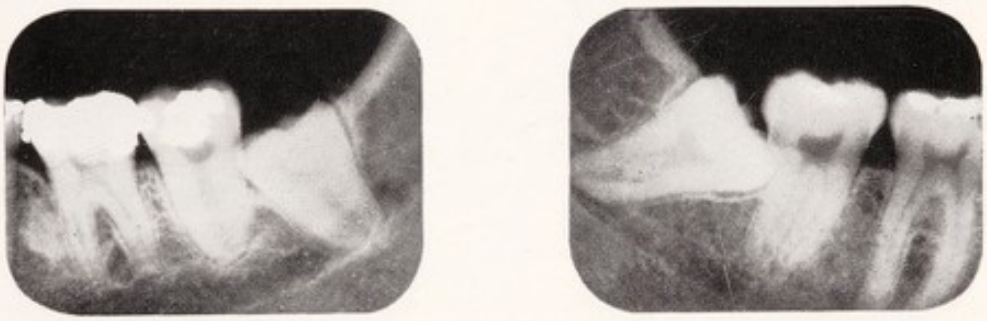


Fig. 541. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Inaccessible. Roots of second molar as well as of third molar are fused, with ossistructure extending on entire mesial, distal, lingual and buccal surfaces.

In the cases shown in Fig. 542 the mesial root is inclined distally and the distal root is inclined mesially. The character of the root formation indicates excision of the ossistructure on the distal surface, although this surface is free of ossistructure down to the gingival

Fig. 542. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially, with ossistructure on distal surface extending up to gingival third and over part of lingual and buccal surfaces.

third. No excision on the buccal surface is indicated, but excision on that part of the mesioclusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar is made to gain access to the mesial surface. When the tooth is directed distally by the application of the exolever to the mesial surface, considerable pressure should be exerted to fracture the septum between the roots, and the extraction is completed by a buccal application.

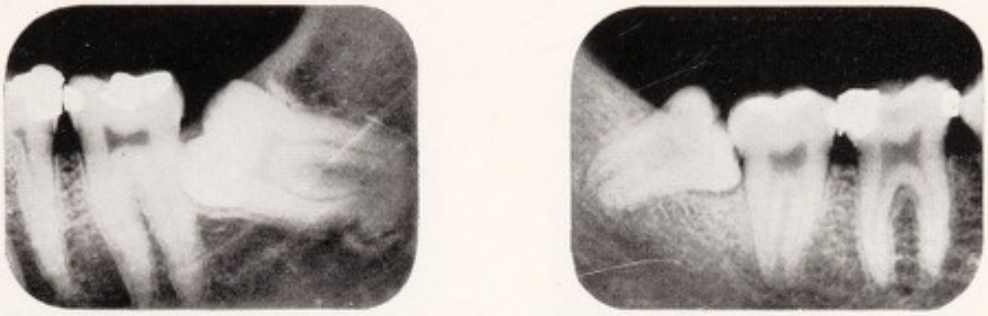
In the cases shown in Fig. 543, where the mesial root is inclined distally and the distal root is inclined mesially, the third molar being of small size, the ossistructure on the distal surface extends up to the occlusal surface, which is slightly involved by a pathologic condition, and is excised to the gingival third. No excision on the buccal surface is indicated, as the tooth, when being directed distally and upward (which movement should be done with considerable pressure to fracture the septum between the roots) can be directed to a point where a buccal application can be made without interference of the superior border of the ossistructure. Excision to gain access with the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar is indicated.

Fig. 543. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces.

In the case shown in Fig. 544 A the mesial root is inclined distally and the distal root is inclined mesially, with a septum between them, and the crown and roots are of large size. The ossistructure on the distal surface extends up to the occlusal surface, being slightly involved by a pathologic condition, and excision on this surface is made down to the gingival third. Excision on the buccal surface distal to the bifurcation is indicated, and is also made over that part of the mesioclusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to gain access to the mesial surface. Considerable pressure is applied when the exolever is adjusted to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, as the septum between the roots in this kind of case will offer a great deal of resistance, and a buccal application to complete the extraction should not

be attempted until the tooth has been loosened sufficiently and directed to a point that will permit such movement to be made.

In the case shown in Fig. 544 B, where the mesial root is straight and the distal root is inclined mesially, with the ossistructure on the distal surface extending slightly beyond the gingival third, excision on the distal surface is indicated beyond this point. Excision on the buccal surface distal to the bifurcation is also indicated, and excision on that part of the mesioclusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar is made to gain access to the mesial surface with the exolever. The tooth is directed to a slight extent distally to clear the distal surface of the second molar, but not too far, as a fracture of either root may occur, and dependence is placed on a buccal application to complete the extraction.



A B

Fig. 544. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Inaccessible. *A*, mesial root inclined distally and distal root inclined mesially, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces; *B*, mesial root straight and distal root inclined mesially. The ossistructure on distal surface extends beyond gingival third, over entire mesial surface and on greater part of lingual and buccal surfaces.

In the case shown in Fig. 545 A, where both roots are divergent, the ossistructure on the distal surface extends slightly beyond the gingival third, on the greater part of the buccal surface, and on the entire mesial surface. Excision is indicated on the distal surface to decrease resistance, on the buccal surface slightly distal to the bifurcation to allow a buccal application, and on that part of the mesioclusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to permit access to the mesial surface. When the exolever is adjusted to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, considerable resistance will be encountered, and there is a liability of a fracture of the roots. The tooth is directed only to a slight extent distally to loosen it and clear the distal surface of the second molar, and dependence is placed on a buccal application to complete the extraction. Considerable resistance may be encountered when the buccal application is being made, and in such a case the application is repeated as may be necessary, each time the blade being sent farther into the bifurcation. The fracture of one or both roots may occur, but

in some cases the roots will remain intact notwithstanding the pressure that may be applied. If, however, the tooth is directed too far distally, a fracture of the roots will occur, and the operator should be prepared to remove any remaining parts.

In the case shown in Fig. 545 B, where there is an extra root, the resistance is decreased by excising on the distal surface beyond the gingival third. No excision is indicated on the buccal surface, and excision is made over that part of the mesioclusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar in order to gain access to the mesial surface. When the exolever is adjusted, the distal movement is made cautiously, the tooth being directed only far enough distally to clear the distal surface of the second molar, and dependence is placed on a buccal application to complete the extraction.

A B

Fig. 545. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Inaccessible. *A*, roots divergent, with ossistructure on distal surface extending slightly beyond gingival third, over entire mesial surface and on greater part of lingual and buccal surfaces; *B*, there is an extra root, with ossistructure on distal surface extending to gingival third and over a part of lingual and buccal surfaces.

In the cases shown in Fig. 546, where the mesial root is inclined distally and the distal root is straight, with the ossistructure on the distal surface extending up to the occlusal surface, which is slightly involved by a pathologic condition, excision on the distal surface is indicated. Excision over that part of the mesioclusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar is also indicated to gain access with the exolever

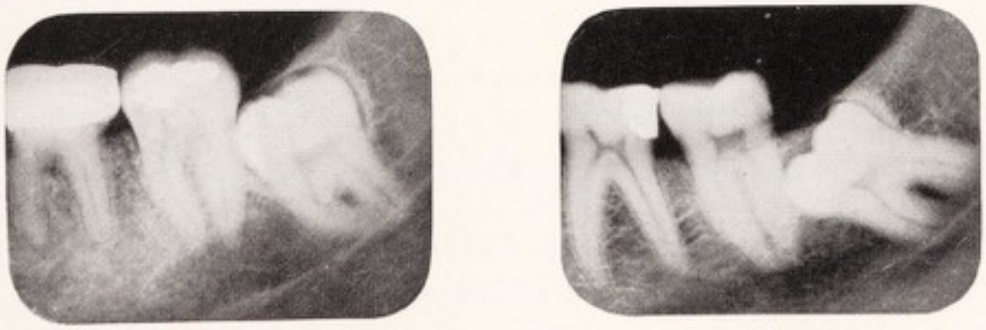
Fig. 546. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root straight. The ossistructure on distal surface extends up to occlusal surface and over greater part of lingual and buccal surfaces.

to the mesial surface, but no excision is indicated on the buccal surface. The tooth is directed to a slight extent distally, but not too far, as a fracture of the distal root may occur, and dependence is placed on a buccal application to complete the extraction.

In the cases shown in Fig. 547, where the mesial root is inclined to a slight extent distally and the distal root is inclined to a slight extent mesially, the ossistructure on the mesial, distal, lingual and buccal surfaces is involved by a pathologic condition. Excision is indicated on the distal surface, as well as on the buccal surface distal to the bifurcation to improve the fulcrum. The mesioclusal surface has the appearance of being accessible, but excision is indicated at this point. The exolever movements on the mesial and buccal surfaces should be deliberately executed, so as not to break down further the ossistructure to be used as a fulcrum.

Fig. 547. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially, with a pathologic condition involving ossistructure on mesial, distal, lingual and buccal surfaces.

In the case shown in Fig. 548 A, where the mesial root is inclined distally and the distal root is straight, the ossistructure extends over the distoclusal surface, and is excised in advance of the excision on the mesial, distal and buccal surfaces. In this type of case the operator may expect the ossistructure to extend over the entire buccal fourth or half of the occlusal surface. The exolever technic is as described for the case shown in Fig. 544 A.



A B

Fig. 548. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Inaccessible. *A*, mesial root inclined distally and distal root straight, with ossistructure extending over part of distoclusal surface, and on entire mesial, distal, lingual and buccal surfaces; *B*, both roots straight, with ossistructure extending over entire occlusal, mesial, distal, lingual and buccal surfaces.

In the case shown in Fig. 548 B, where the roots are large in size and straight, the ossistructure extends over the entire occlusal surface, and is excised in advance of the excision on the mesial, distal and buccal surfaces. When executing the exolever technic, considerable resistance will be encountered, as the tooth will necessarily have to be directed distally and upward to a point where a buccal application can be made to complete the extraction.

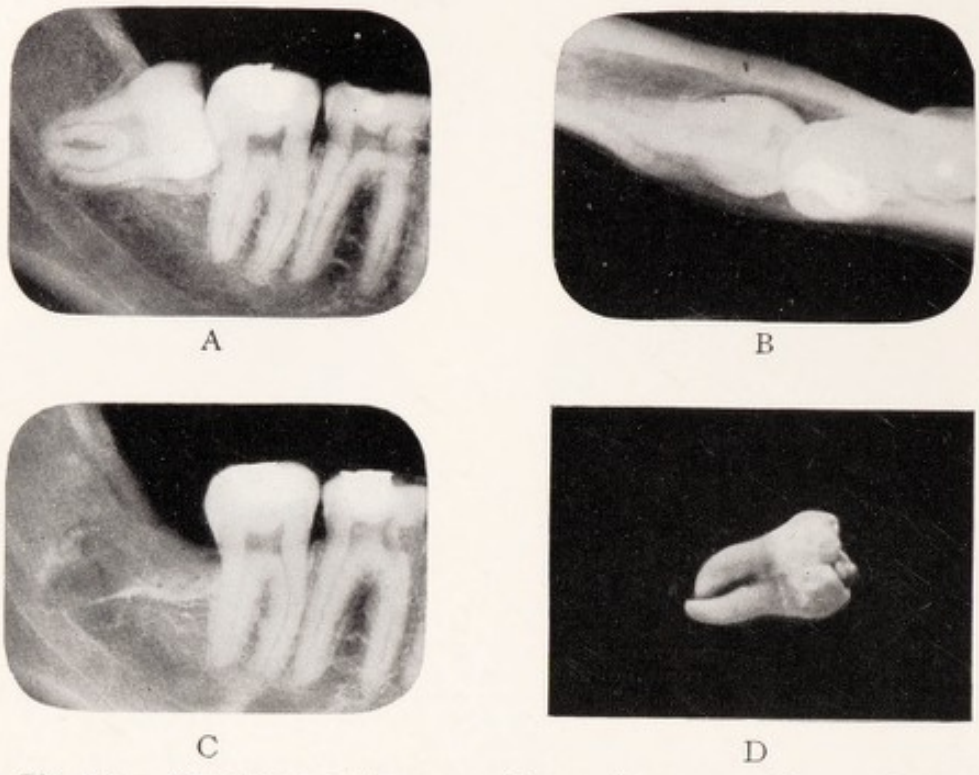


Fig. 549. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Inaccessible. Same case. *A*, mesial root inclined distally and distal root inclined mesially, with ossistructure on distal surface extending beyond gingival third, over greater part of buccal and lingual surfaces and on entire mesial surface; *B*, occlusal radiogram of case, which shows a slight buccal deflection; *C*, radiogram made after extraction; *D*, photograph of extracted tooth.

In the case shown in Fig. 549 A, where the mesial root is inclined distally and the distal root is inclined mesially, excision on the distal surface and over that part of the mesioclusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar is made to gain access to the mesial surface, no excision being indicated on the buccal surface. The exolever is adjusted with pressure to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, and the tooth is directed distally and upward in order to clear the distal surface of the second molar; the extraction is then completed by a buccal application. The second molar is shown deflected slightly upward and is out of alignment with the first on account of the pressure caused by the impacted tooth. Fig. 549 B is an occlusal radiogram of the case which shows a slight buccal deflection; Fig. 549 C is a radiogram made of

the case after the extraction, and Fig. 549 D is a photograph of the extracted tooth.

In the case shown in Fig. 550 A the mesial root is inclined distally and the distal root is inclined mesially and the ossistructure extends over the entire buccal half of the occlusal surface and on the entire mesial, distal, lingual and buccal surfaces. Excision is indicated on the distal surface and over the buccal half of the occlusal surface up

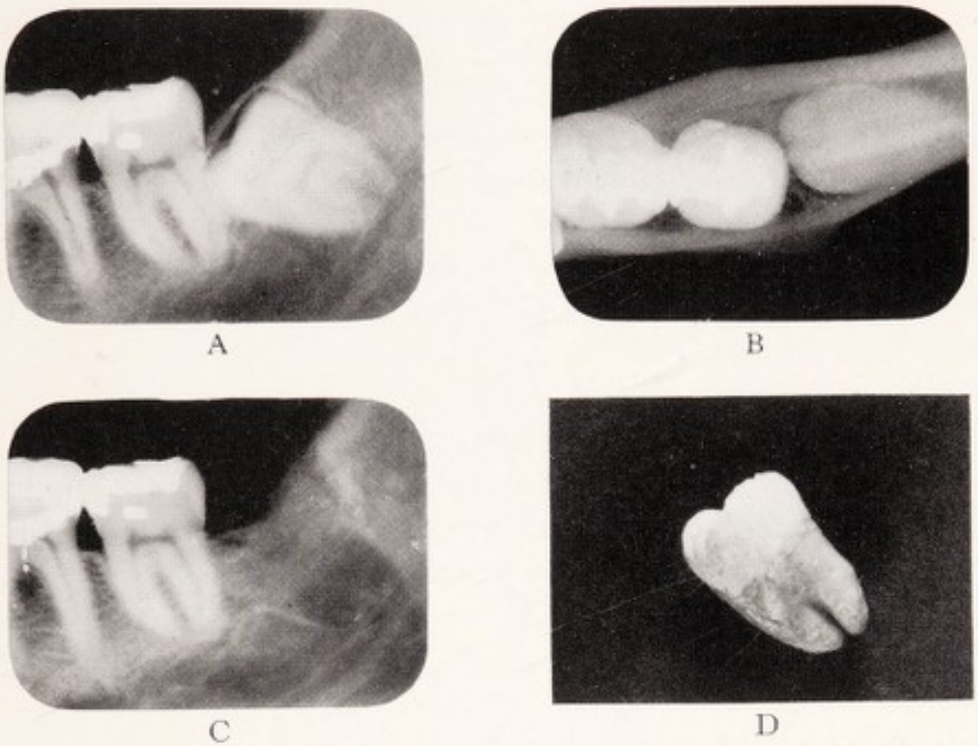


Fig. 550. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Inaccessible. Same case. *A*, mesial root inclined distally and distal root inclined mesially, with ossistructure extending over buccal half of occlusal surface, and over entire mesial, distal, lingual and buccal surfaces; *B*, occlusal radiogram of case, which shows a buccal deflection; *C*, radiogram made after extraction; *D*, photograph of extracted tooth.

to the mesial surface, but no excision is indicated on the buccal surface. The tooth is directed distally and upward by the adjustment of the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, and the extraction is completed by the latter application. Fig. 550 B is an occlusal radiogram of the case, which shows the extent of the buccal deflection; Fig. 550 C is a radiogram made after the extraction, and Fig. 550 D is a photograph of the extracted tooth.

LINGUAL DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

The third molar impacted in a mesioangular position, with the buccal surfaces deflected to a slight extent lingually out of alignment with the buccal surface of the second molar, is a type of impaction not frequently seen.

CLINICAL EXAMINATION

Exposed Crown.—A part of the crown may be exposed, and, if there is such an exposure, it is usually the buccoclusal surface or the distal surface.

Gum Tissue.—The gum tissue usually covers the greater part of the tooth, and, if there is any exposure, it is usually a small part of the crown.

RADIOGRAPHIC INTERPRETATION

Crown.—A part of the occlusal surface is visible, but not so much of it is seen as is usually shown in a linguoangular or complete lingual impaction. The lingual deflection of the third molar should be checked with the first and second molars, and it will be noted that these two teeth show definite enamel caps, but no part of their occlusal surfaces is visible. There is a variation in the location of the mesial surface in its relation to the superior border of the ossistructure, and this surface is accessible to the immediate application of the exolever.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root inclined mesially, 12; mesial root inclined distally and distal root straight, 8; fused roots, 7; both roots straight, 5; partially developed roots, 5; both roots inclined distally, 3, and divergent roots, 3.

Ossistructure.—The mesial surface is accessible to the application of the exolever, and no excision on this surface is necessary. Excision on the distal surface is indicated, but no excision on the buccal surface is necessary in the majority of cases.

OPERATIVE TECHNIC

The position of the occlusal surface of the third molar and the alignment of the buccal surface of this tooth with the corresponding surface of the second molar are determined in advance of the operative technic.

Gum Tissue Technic.—The operator, when making the clinical examination, can usually gain some knowledge as to the extent of the lingual deflection of the tooth by the bulging of the gum tissue and by palpation. In many cases the mesial surface is accessible without incision, but, where the gum tissue will not allow the immediate application of the exolever, an incision is made along the buccal half of the distal surface of the second molar, which procedure will allow the exolever to be applied to the mesial surface of the third molar without causing trauma to the gum tissue. The

alignment of the buccal surface is usually slightly lingual to the buccal surface of the second molar, and the excision is made distally from the second molar to a point that will permit excision of the ossistructure on the distal surface of this tooth and allow the application of the exolever, when indicated, to the buccal surface. The incision is made similar to that illustrated for a vertical impaction where there is a lingual deflection and the mesial surface is accessible (Fig. 441, page 419).

Ossistructure Technic—Distal Excision.—No excision on the mesial surface is indicated in gaining access to this surface. The location of the ossistructure on the distal surface and the lingual inclination of the tooth will determine the extent of excision that is to be made

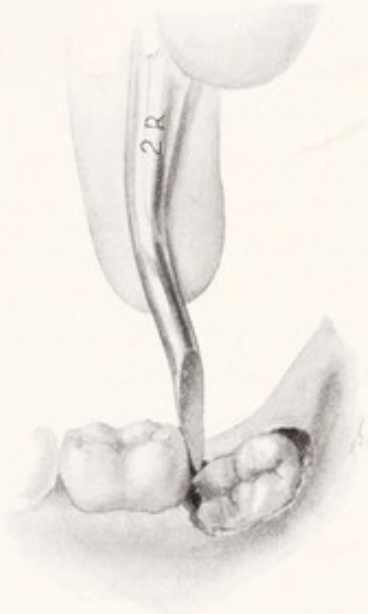


Fig. 551. — Mesial Application of Exolever—Mesioangular Impaction—Lingual Deflection—Mesial Surface Accessible. Exolever No. 2R applied to that part of mesial surface that is deflected lingually out of alignment with distobuccal surface of second molar, where excision has been made on distal surface and over lingual fourth of occlusal surface.

on the distal surface. Ossisector No. 1L or 2L for the left side or No. 1R or 2R for the right side is selected for this excision, and any gum tissue over the occlusal and distal surfaces is displaced with the back of the blade. When applying the ossisector, the alignment of the tooth is borne in mind, as the operator should be certain that he has located the distobuccal surface where the excision is to be started. The excision is made toward the distal surface, as described on page 467, and should be sufficient to permit to tooth to be directed distally in conformity with the root formation. No dependence is to be placed on a pathologic area that may be on the distal surface, as there will usually be a ledge of ossistructure on the distolingual surface which is not discernible in the radiogram, and excision is made as in a case where no pathologic area exists. No excision is

necessary on the buccal surface to allow an exolever to be adjusted to this surface.

Exolever Technic—Mesial Application.—The space between the ossistructure below the mesial surface of the third molar and the distal surface of the second is not, as a rule, very large, and exolever No. 2L for the left side or No. 2R for the right side is selected, as it has a very small blade which can be readily inserted into the small space between the mesial surface of the third molar and the ossistructure below this surface. The gum tissue on the buccal surface is displaced with the back of the blade, and the blade is directed into the abnormal interproximal space between the second and third molars, with the flat side applied to the mesial surface of the third molar and the rounded side engaging the superior border of the ossistructure, the latter being utilized as a fulcrum (Fig. 551).

When the exolever has been adjusted, the tooth is directed distally, and, as the roots in the majority of cases are not very long, the initial application usually extracts the tooth. If, however, the tooth is not extracted by this procedure, the exolever is adjusted to the buccal surface at the bifurcation to complete the extraction.

Buccal Application.—Where the tooth has not been extracted by the application of the exolever to the mesial surface, or where the root formation does not indicate such a procedure after the tooth has been directed distally, exolever No. 10L or 10R is then adjusted to the buccal surface at the bifurcation, when the handle of the exolever is pressed downward and turned buccally to direct the tooth out of its socket, as described on page 472. When the operator makes the buccal application, he should bear in mind that the ossistructure on the buccal surface is not very heavy, and is not so suitable a fulcrum as where the buccal surface of the third molar is in alignment with the corresponding surface of the second. If the blade is not carefully applied, it is liable to slide over the ossistructure instead of being directed toward the bifurcation of the tooth. If it is seen that an adjustment cannot be obtained on the buccal surface, when indicated, excision of the ossistructure on this surface distal to the bifurcation is made to allow a buccal application.

SUMMARY OF CASES

In the case shown in Fig. 552 A, where the mesial root is inclined distally and the distal root is straight, a pathologic condition slightly involves the ossistructure on the distal surface. Excision on the distal surface is indicated, especially in the region of the distolingual surface, where there is invariably a solid ledge of ossistructure that is not involved by pathologic changes. The exolever is adjusted to

the mesial surface to direct the tooth distally far enough to overcome the distal curvature of the mesial root, and the extraction is completed by a buccal application.

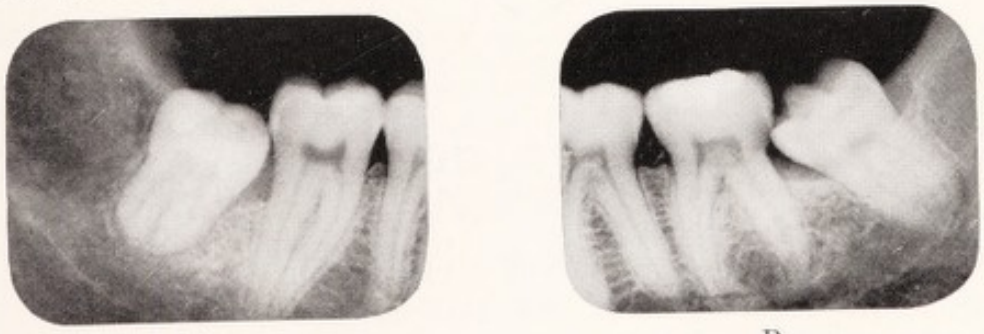
In the case shown in Fig. 552 B the condition is similar to that shown in Fig. 569, except that pathologic changes have not involved the ossistructure on the distal surface, and a slight excision on this surface is indicated.

A B

Fig. 552. — Mesioangular Impaction—Lingual Deflection—Mesial Surface Accessible. *A*, mesial root inclined distally and distal root straight. The ossistructure on distal surface, which is slightly involved by a pathologic condition, extends over part of lingual and buccal surfaces. *B*, mesial root inclined distally and distal root straight, with ossistructure on distal surface extending over greater part of lingual and buccal surfaces.

In the case shown in Fig. 553 A, where the mesial root is inclined distally and the distal root is inclined mesially, with the ossistructure on the distal surface extending up to the occlusal surface, excision on this surface down to the gingival third is indicated. The exolever is adjusted to the mesial surface to direct the tooth distally with sufficient pressure to fracture the septum between the roots, and a buccal application is made to complete the extraction.

In the case shown in Fig. 553 B, where the mesial root is inclined distally and the distal root is inclined mesially, with pathologic changes involving the ossistructure on the mesial, distal, lingual and buccal surfaces, no excision is indicated. When a buccal application is made at the bifurcation, if it is observed that a suitable fulcrum



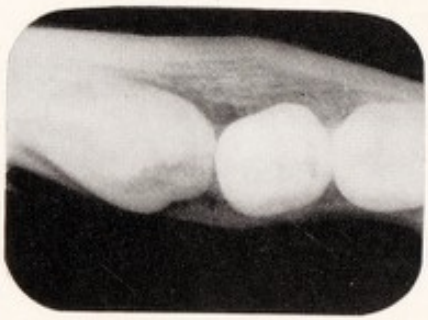
A B

Fig. 553. — Mesioangular Impaction—Lingual Deflection—Mesial Surface Accessible. *A*, mesial root inclined distally and distal root inclined mesially, with ossistructure on distal surface extending up to occlusal surface and over greater part of lingual and buccal surfaces; *B*, mesial root inclined distally and distal root inclined mesially, with a pathologic condition involving ossistructure on mesial, distal, lingual and buccal surfaces.

cannot be obtained where this condition prevails, an excision is made at the point where the bifurcation will be located after the tooth has been directed distally by the application of pressure with the exolever to the mesial surface.

In the case shown in Fig. 554 A, where both roots are inclined distally, the ossistructure on the distal surface extends up to the occlusal surface, and, on account of the character of the root formation, the excision on this surface should extend to the gingival third. No excision is indicated on the buccal surface, and the exolever, when adjusted to the mesial surface, should direct the tooth distally out of the socket in conformity with the root formation in order to avoid a fracture of the roots. In Fig. 554 B is shown an occlusal radiogram of the case; Fig. 554 C is a photograph of the extracted tooth, which should be compared with the lingual radiogram.

A



B

C

Fig. 554. — Mesioangular Impaction—Lingual Deflection—Mesial Surface Accessible. Same case. *A*, both roots inclined distally, with ossistructure on distal surface extending up to occlusal surface and over greater part of lingual and buccal surfaces; *B*, occlusal radiogram of same case; *C*, photograph of extracted tooth.

LINGUAL DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

This type of impaction, where the mesial surface is inaccessible to the immediate application of the exolever, and where the occlusal and buccal surfaces are deflected to a slight extent lingually out of alignment with the buccal surface of the second molar, is more frequently seen than where the tooth is deflected lingually and the mesial surface is accessible.

CLINICAL EXAMINATION

Exposed Crown.—As a rule, no part of the crown is exposed, but, if there is any exposure, it will be only a small part of the distobuccal or buccoclusal surface.

Gum Tissue.—The description above in regard to the exposed crown will apply to the condition of the gum tissue.

RADIOGRAPHIC INTERPRETATION

Crown.—A part of the occlusal surface of the third molar is visible, but no part of the occlusal surface of the first and second molars is shown. The first and second molars show well-defined enamel caps and pulp chambers. There is no overlap of the mesial surface of the third molar upon the distal root of the second, and there is a normal contact between the first and second molars. The lingual deflection of the third molar is determined by a part of its occlusal surface being visible.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root straight, 8; mesial root inclined distally and distal root inclined mesially, 8; fused roots, 7; partially developed roots, 5; both roots straight, 3; both roots inclined distally, 3; divergent roots, 3; hypercementosed roots, 2, and mesial root straight and distal root inclined mesially, 1.

Ossistructure.—The mesial surface is inaccessible to the application of the exolever, and the ossistructure on the distal surface usually extends up to the occlusal surface. The ossistructure on the buccal surface is not, as a rule, very heavy, but usually extends almost up to the occlusal surface, and occasionally the ossistructure extends over the buccal or lingual half of the occlusal surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—As the gum tissue usually covers the entire tooth, the occlusal and buccal surfaces being deflected lingually, the incision is made distally in line with the buccoclusal surface, which is often in line with the center of the distal surface of the second molar. The incision is started on the distal surface of the second molar, and is continued along the buccoclusal surface to a point a short distance beyond the distal surface to permit excision on this surface. If, after this incision is made, it is observed that the gum tissue cannot be displaced to excise the ossistructure on the mesiobuccal surface or to apply the exolever, a second incision is made along the buccal half of the distal surface of the second molar. This last incision is made

downward and buccally to a point where the gum tissue on the mesiobuccal surface can be displaced without disturbing the gum tissue protecting the buccal surface of the second molar. Where the gum tissue on the lingual half of the distal surface is liable to be injured, incision is then made along the surface mentioned above. The incision is made similar to that illustrated for a vertical impaction where there is a lingual deflection and the mesial surface is inaccessible (Fig. 456, page 432).

Ossistructure Technic—Distal Excision.—Excision of the ossistructure on the distal surface is made to decrease resistance, the extent of excision being governed by the character of the root formation. Ossisector No. 2L or 3L for the left side or No. 2R or 3R for the right side is selected, and the gum tissue over the occlusal and distal surfaces is displaced with the back of the blade, when the blade, being held in an angular position, is directed toward the tooth slightly distal to the ossistructure to be excised, as described on page 483. The operator should bear in mind the lingual deflection of the tooth and start the excision at the distobuccal surface, excising first in this area and continuing toward the distolingual surface. The operator, when adjusting the ossisector where the tooth is in a mesioangular position and deflected lingually, should bear in mind that the ossistructure in this region is often very dense and not readily excised. The internal oblique ridge may extend to the center of the distal surface. If this condition exists excision is further complicated, and ossisector No. 5L for the left side or No. 5R for the right side is initially used to penetrate through the dense ossistructure, as illustrated in Fig. 506, page 484.

Buccal Excision Distal to Bifurcation.—Excision on the buccal surface distal to the bifurcation is made when indicated. This excision is not, as a rule, difficult to execute, as the ossistructure on the buccal surface is usually not very heavy where the tooth is deflected lingually. Ossisector No. 11L for the left side or No. 11R for the right side is selected, and the excision is started at the superior border of the ossistructure distal to the bifurcation, and extended to a point where a secure adjustment with the exolever on the buccal surface at the bifurcation can be obtained, utilizing the ossistructure at this point as a fulcrum, as described on page 484.

Mesiobuccal Excision.—As the ossistructure on the mesiobuccal surface is usually very thin, the excision at this point to reach the mesial surface is not so difficult, nor is the angle of approach with the ossisector the same as where the buccal surface of the third molar is in alignment with the corresponding surface of the second. The alignment of this surface is lingual to the buccal surface of the second molar, and the operator should observe this alignment when

approaching the buccal surface for excision of the ossistructure. Ossisector No. 10L for the left side or No. 10R for the right side is selected, and the gum tissue on the mesiobuccal surface of the third molar and the distal surface of the second is displaced with the back of the blade. Excision is started at the superior border of the ossistructure and extended downward on the mesiobuccal surface to a point where the exolever can be adjusted to the mesial surface, the blade being applied along the mesiobuccal surface of the third molar and care being taken not to mar the distal surface of the second molar (Fig. 555).

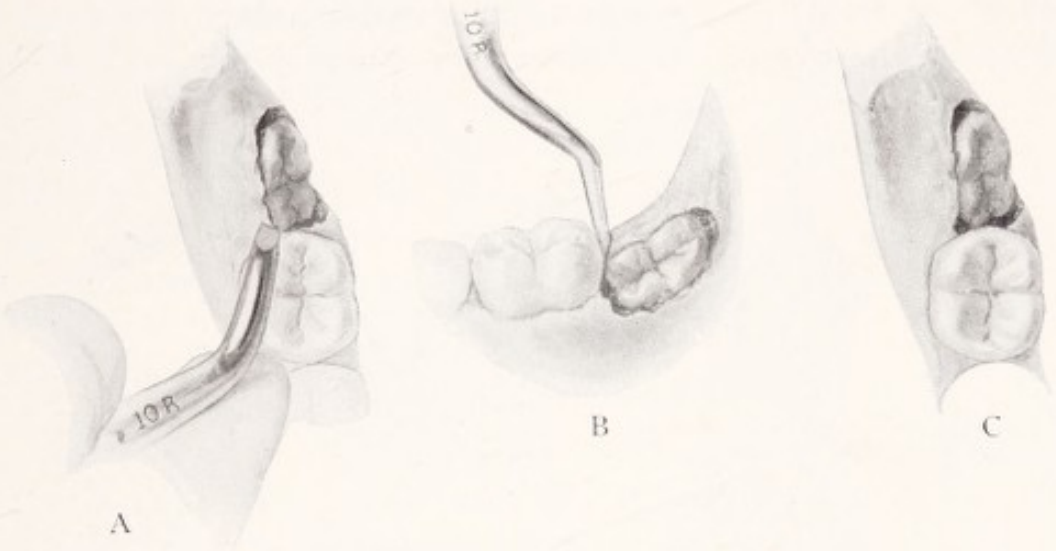


Fig. 555. — Mesiobuccal Excision of Ossistructure—Mesioangular Impaction—Lingual Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 10R, viewed from occlusal, applied to mesiobuccal surface for excision in order to apply exolever to mesial surface; *B*, instrument applied, viewed from buccal; *C*, incision made on mesiobuccal surface, on distal surface and over lingual fourth of occlusal surface.

Occlusal Excision.—The ossistructure does not, as a rule, extend over the entire occlusal surface, but, where the structure extends to any extent over the latter surface, it usually extends over the lingual or buccal half, and there is usually a space between the occlusal surface and the ossistructure. The excision over the buccal half is made with ossisector No. 8L for the left side or No. 8R for the right side, the blade being kept toward the buccal half of the tooth, as described on page 512.

Where the ossistructure extends over the lingual fourth or half of the occlusal surface, the resistance resulting from the ledge over the surface, if not excised, will interfere with the exolever movements. It should be a routine procedure in all cases where the mesial surface is below the superior border of the ossistructure to determine before the exolever technic is executed whether any ossistructure extends over the lingual fourth or half of the occlusal surface, as the radiogram will not always definitely determine this condition. This is done

with ossisector No. 11L for the left side or No. 11R for the right side, and the gum tissue over the occlusal surface is displaced with the blade of the ossisector and directed toward the linguoclusal surface, and excision is started over the occlusal at the mesiolingual surface by inserting the blade between this surface and the superior border of the ossistructure (Fig. 556). This excision is made with the blade under control toward the lingual surface, and, as the structure is not very dense, no great resistance will be encountered, but the operator should exercise precaution not to injure the gum tissue on the lingual surface of the tooth by losing control of the instrument. Excision along the occlusal surface is continued until the entire lingual fourth or half of the crown is free of ossistructure. In the majority of cases where

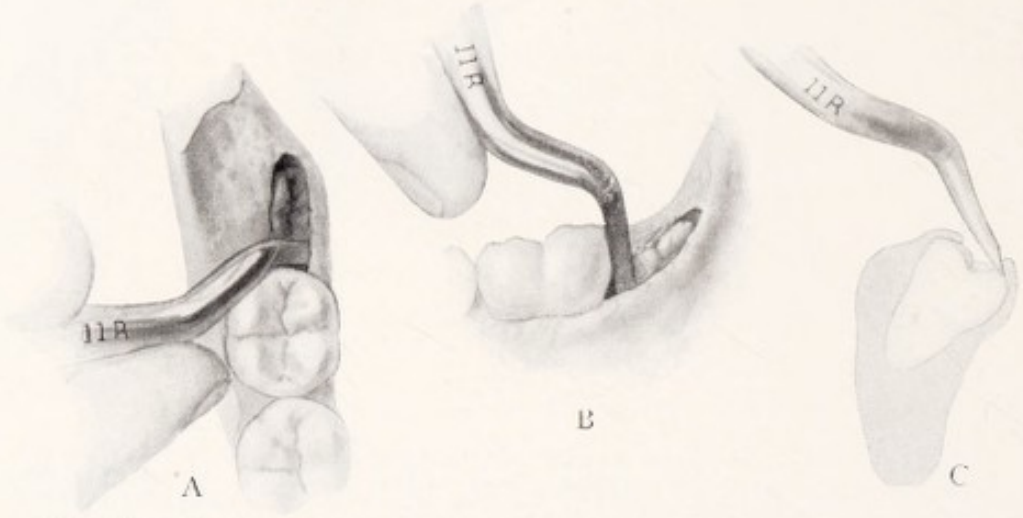


Fig. 556. — Excision of Ossistructure over Lingual Fourth of Occlusal Surface—Mesioangular Impaction—Lingual Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 11R, viewed from occlusal, applied for excision of ossistructure over lingual fourth of occlusal surface; *B*, application, viewed from buccal; *C*, frontal section, showing blade wedged between superior border and occlusal surface.

the roots are partially developed this condition of the ossistructure will invariably be present.

Exolever Technic—Mesial Application.—When excision has been made on the mesiobuccal, occlusal, buccal and distal surfaces, exolever No. 2L for the left side or No. 2R for the right side is selected, and the gum tissue on the mesiobuccal surface is displaced with the back of the blade. The blade is directed between the mesial surface of the third molar and the superior border of the ossistructure along the mesiobuccal surface (Fig. 551, page 525). After the blade has been adjusted, the wedge created usually loosens the tooth, and it is directed distally and upward by turning the handle of the exolever mesially. With the small blade the fulcrum will be lost when the initial movement is made to direct the tooth distally, and exolever No. 3L or 4L for the left side of No. 3R or 4R for the right side is adjusted. The exolever

movement is repeated as may be necessary, and will raise the tooth out of its socket to a point where the lingual half of the distal surface of the second molar is used as a fulcrum or where a buccal application can be made.

Buccal Application.—Where a buccal application is indicated, exolever No. 10L for the left side or No. 10R for the right side is selected, and care should be exercised in making the adjustment to avoid sending the blade down on the ossistructure on the buccal surface between the ossistructure and the gum tissue. The operator should be certain that the adjustment is on the buccal surface at the bifurcation and that there is sufficient ossistructure to serve as a fulcrum. The exolever blade is directed downward, creating a wedge, which movement will extract the tooth in an upward and lingual direction, and, when resistance is encountered the handle is directed buccally, as described for a buccal application (page 472). Where the condition indicates that a buccal adjustment cannot be securely made (and this will occur only in an occasional case) excision on the buccal surface is extended to a point where a secure adjustment can be obtained.

SUMMARY OF CASES

In the cases shown in Fig. 557, where both roots are inclined distally, with the ossistructure extending entirely on the mesial, distal and buccal surfaces, excision on these surfaces is indicated. Excision is also indicated over the lingual fourth of the occlusal surface. The exolever is adjusted to the mesial surface, when the tooth is directed

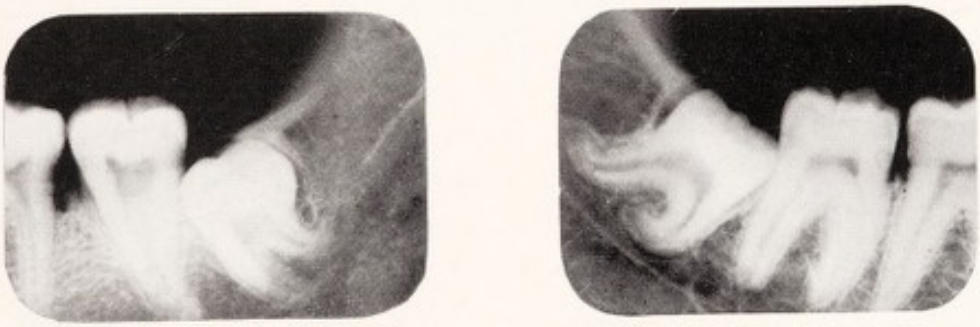


Fig. 557. — Mesioangular Impaction—Lingual Deflection—Mesial Surface Inaccessible. Both roots inclined distally, with ossistructure extending over lingual fourth of occlusal surface and over entire mesial, distal, lingual and buccal surfaces.

distally and upward, and the extraction is completed by this movement if the root formation will permit. If, however, the roots are markedly divergent, a buccal application of the exolever is indicated.

In the cases shown in Fig. 558, where the mesial root is inclined distally and the distal root is straight, with the ossistructure extending over the greater part of the distal surface, excision on this surface is indicated in addition to excision on the mesiobuccal surface. No

excision is indicated on the buccal surface, as the tooth can be directed distally and upward to a distance to obviate excision on this surface. Excision should be made over the occlusal surface in the location of the mesiolingual surface. The exolever movement is made distally far enough to overcome the curvature of the mesial root, when a buccal application is made to complete the extraction.

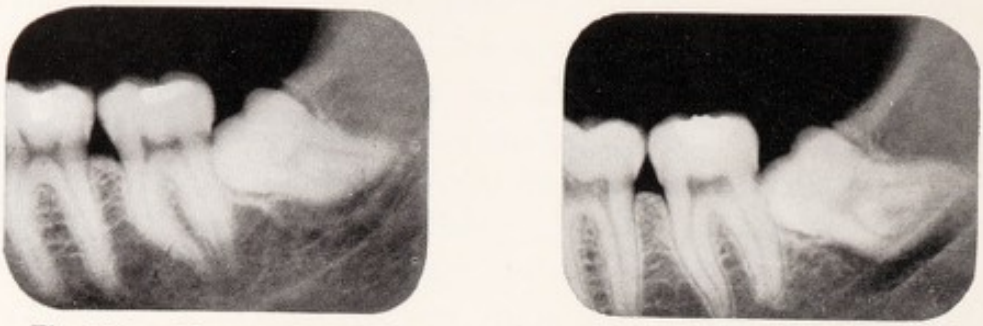


Fig. 558. — Mesioangular Impaction—Lingual Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root straight, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces.

In the cases shown in Fig. 559, where both roots are straight and divergent, with the ossistructure extending entirely over the mesiobuccal, distal and buccal surfaces, excision is indicated on these surfaces. Excision is also indicated over the lingual half of the occlusal surface. Slight pressure is exerted when the exolever is applied to the mesial surface to overcome the resistance of the roots and to loosen the tooth, but it should not be directed too far distally, or there will be a fracture of one of the roots. The extraction is completed by a buccal application. In a case of this character an operator not accustomed to making a buccal application should make an excision on the buccal surface distal to the bifurcation sufficient to secure a dependable fulcrum.

In the cases shown in Fig. 560, where the root formations are varied, excision over the occlusal surface at the buccal and lingual half is made in addition to the excision on the mesial, distal and buccal surfaces. The exolever movements are made in conformity with the root formation.

Fig. 559. — Mesioangular Impaction—Lingual Deflection—Mesial Surface Inaccessible. Both roots straight and divergent, with ossistructure extending over lingual fourth of occlusal surface and on entire mesial, distal, lingual and buccal surfaces.

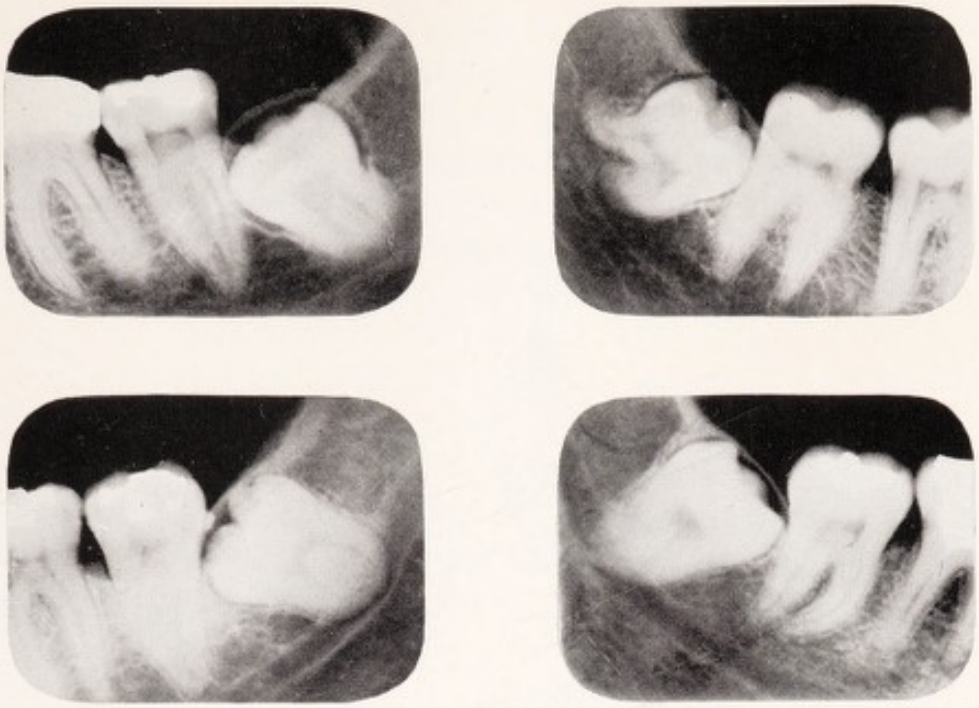


Fig. 560. — Mesioangular Impaction—Lingual Deflection—Mesial Surface Inaccessible. There is a variation in root formation, with ossistructure extending over buccal and lingual half of occlusal surface, and on entire mesial, distal, lingual and buccal surfaces.

In Fig. 561 are shown two types of cases where the diagnostic points would indicate a lingual deflection. This is determined where the first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surface is shown; however, the third molar shows a part of its occlusal surface. If no occlusal radiogram is made of the cases shown after the incision of the gum tissue has been made, the tooth will be found deflected in a buccoangular position and should be treated accordingly. This condition is very deceptive, and is not a common occurrence, but it shows the value of checking all lingual radiograms with occlusal radiograms.

Fig. 561. — Mesioangular Impaction—Mesial Surface Inaccessible. Diagnostic points indicate a lingual deflection, but an occlusal radiogram will show a slight buccoangular deflection.

BUCCOLINGUAL DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

A case where the third molar is in a mesioangular position, with a buccolingual deflection and with the mesial surface accessible, is fre-

quently seen, and this condition often has a tendency to deflect the second molar to a slight extent lingually (Fig. 562). The object to be attained is to direct upward and distally that part of the third molar that is in contact with the distobuccal surface of the second, so that the latter tooth will not interfere with the exolever movements when the instrument is adjusted to the buccal surface at the bifurcation to complete the extraction.

Fig. 562. — Mandible Showing Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Accessible. Buccolingual deflection of third molar with contact at gingival third of second molar; pressure of tooth has deflected second molar lingually.

CLINICAL EXAMINATION

Crown.—A part of the crown may be exposed through the gum tissue.

Gum Tissue.—The gum tissue usually covers the entire tooth, or a small part may be exposed.

RADIOGRAPHIC INTERPRETATION

Crown.—A part of the occlusal surface of the third molar is in contact with the distobuccal surface of the second, a condition which is indicated in the radiogram by an overlap, and the location of the contact varies from the occlusal surface of the third molar down to and below the gingival third of the second. An examination of the radiogram as to the contact of the first and second molars shows no overlap, and both of these teeth show definite enamel caps and pulp chambers, indicating a buccal deflection, while the fact that a part of the occlusal surface of the third molar is visible indicates a lingual deflection. The deflection of a part of the third molar out of alignment

buccally with the distobuccal surface of the second and the fact that the occlusal surface of the third molar is inclined lingually together indicate a buccolingual deflection.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root inclined mesially, 13; both roots inclined distally, 5; both roots inclined mesially, 3; mesial root inclined distally and distal root straight, 3; fused roots, 3; partially developed roots, 3; both roots straight, 2; mesial root straight and distal root inclined mesially, 2; divergent roots, 2, and hypercementosed roots, 2.

Ossistructure.—The ossistructure on the mesial surface will not interfere with the immediate application of the exolever to this surface, and a pathologic condition is often present in this region. The distal surface is often free of ossistructure down to the gingival third, but the structure may extend up to the occlusal surface, and a pathologic condition is usually present on this surface. On the buccal surface the location of the ossistructure varies, and in some cases the entire surface is free, while in other cases the structure extends on the greater part of this surface. It is not unusual in this type of case to find that a pathologic condition has involved the ossistructure on the mesial, distal, lingual and buccal surfaces, and, when such a condition is present, excision on the buccal surface distal to the bifurcation is indicated to improve the fulcrum. In an occasional case the ossistructure may extend over the distoclusal surface or over the lingual fourth of the occlusal surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—Where any part of the crown is exposed, the operator will have no difficulty in determining the alignment of the buccal surface of the third molar with the corresponding surface of the second. The incision is started where the mesioclusal surface of the third molar is in contact with the distobuccal surface of the second, and extends downward and buccally along the mesiobuccal surface. Where the greater part of the crown is exposed, a second incision is made, following distally the alignment of the buccal surface, to permit excision on the distal surface and allow the application of the exolever to the buccal surface (Fig. 563 A). Where a buccal application is not indicated, the incision is then made distally along the center of the distal surface (Fig. 563 B). Where the gum tissue covers the greater part of the third molar, the initial incision is made on the distobuccal surface of the second molar, and extended downward and buccally and along that part of the mesioclusal surface in contact with

the distobuccal surface of the second molar. Incision is then made distally following the buccal surface of the third molar, and extended to a point that will permit excision and the application of the exolever. Incision is then made along the distobuccal surface of the second molar (Fig. 563 C).

Where that part of the mesioclusal surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second extends on the buccal surface of the second molar to the bifurcation, the incision will be different from that described above. The incision is made downward on the buccal surface of the second molar slightly anterior to the bifurcation. A second incision is made distally at a right angle to the distobuccal surface of the second molar,

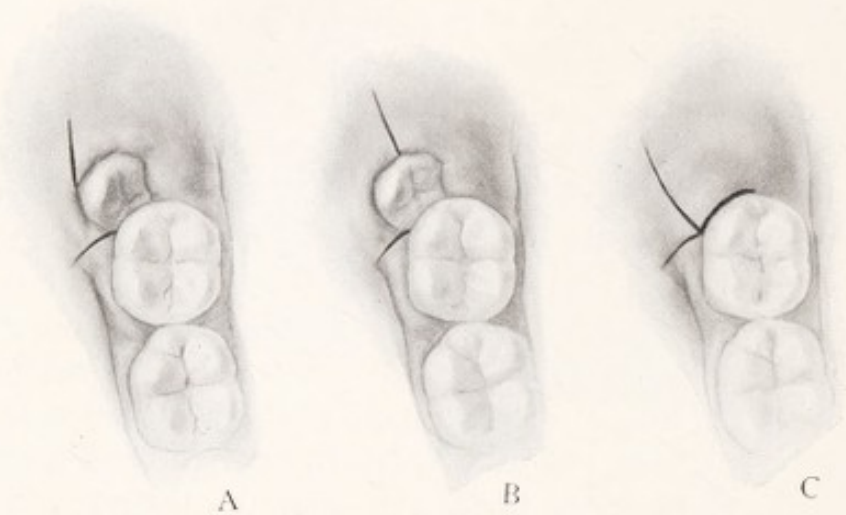


Fig. 563. — Incision of Gum Tissue—Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Accessible. *A*, incision downward and buccally at point of contact of mesiobuccal surface and distal to exposed buccal surface, indicated where a buccal application is to be made; *B*, mesiobuccal incision, same as *A*. Distal incision is made distal to center of distal surface, indicated where no buccal application is to be made; *C*, incision downward and buccally at distobuccal surface of second molar at point of contact of mesiobuccal surface, along buccal surface of third molar, and on distobuccal surface of second.

and this will place the incision about in the center of the distal surface of the third molar, and this is followed by an incision on the distobuccal surface of the second molar. The latter incision will permit the excision of the ossistructure and allow the application of the exolever, avoiding injury to the gum tissue and at the same time protecting the second molar after the extraction of the third.

Ossistructure Technic—Distal Excision.—As the mesial surface is accessible to the application of the exolever, excision of the ossistructure on this surface is not indicated. The involvement of the ossistructure below the mesial surface, which occurs frequently, is a disadvantage in some cases, as it will not furnish the ideal fulcrum that would be obtained if the ossistructure were normal, and, when used as a fulcrum, too many applications of the exolever should be avoided so as

not to break down the structure further. When excision on the distal surface is indicated, it is made with ossisector No. 2L or 3L for the left side or No. 2R or 3R for the right side. The gum tissue is displaced with the back of the blade, and the blade is directed toward the distal surface of the third molar, which is not in alignment distally with the buccal surface of the second molar, but is often at a marked angle to the distobuccal surface. The excision is kept in alignment with the distal surface (Fig. 564), and, as the internal and external oblique ridges will be in close proximity to the distal surface, care should be taken not to excise any ossistructure other than that on the distal surface. Where the external or internal oblique ridge extends to the distal surface the difficulty of excision is increased. Where the latter

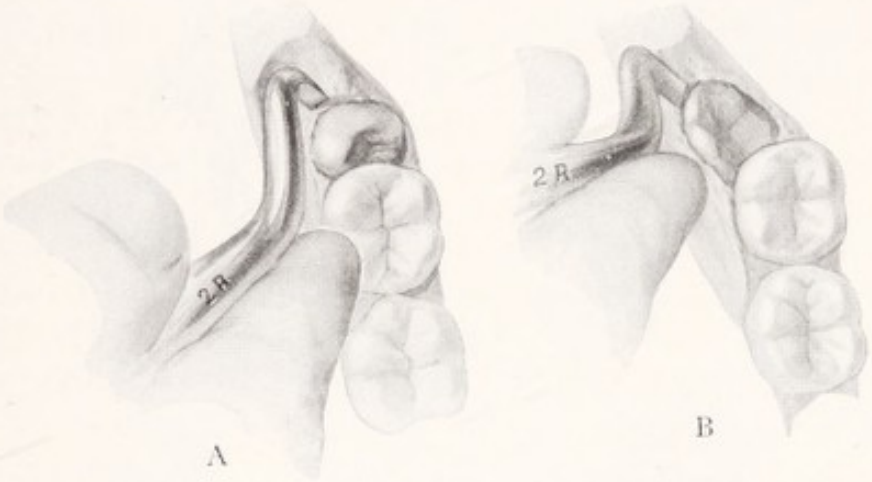


Fig. 564. — Distal Excision of Ossistructure—Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Accessible. *A*, ossisector No. 2R applied for a distal excision, where part of distal surface is free of ossistructure; *B*, same instrument applied where structure extends on distal surface up to occlusal surface.

condition exists, the initial excision is made with ossisector No. 5L or 5R, as illustrated in Fig. 506, page 484.

Buccal Excision Distal to Bifurcation.—Excision on the buccal surface is indicated in an occasional case where the root formation indicates such a procedure and the ossistructure on this surface extends up to the occlusal surface and where a pathologic condition has involved the structure. Excision for access to this surface is made with ossisector No. 11L for the left side or No. 11R for the right side. There is usually a space between the buccal surface and the ossistructure on this surface which permits ready access with the ossisector blade and often obviates excision. The excision is made on this surface distal to the bifurcation, and only sufficient to permit a buccal adjustment of the exolever blade (Fig. 507, page 485). The external oblique ridge demands that the excision be confined as closely as possible to the buccal surface of the tooth and is made in alignment with the buccal surface. The excision is made in an occasional case

over the distoclusal surface, as described for a vertical impaction (page 349).

Occlusal Excision.—Where the contact of the third molar is at the gingival third of the second molar, the superior border of the ossistructure may extend over the lingual fourth of the occlusal surface and will increase resistance if not excised in advance of the exolever technic. The excision is made with exolever No. 11L or 11R, and the gum tissue over the occlusal surface is displaced with the back of the blade, which is directed along the distal surface of the second molar to the ledge of ossistructure over the lingual fourth of the occlusal surface. The blade is wedged between the occlusal sur-

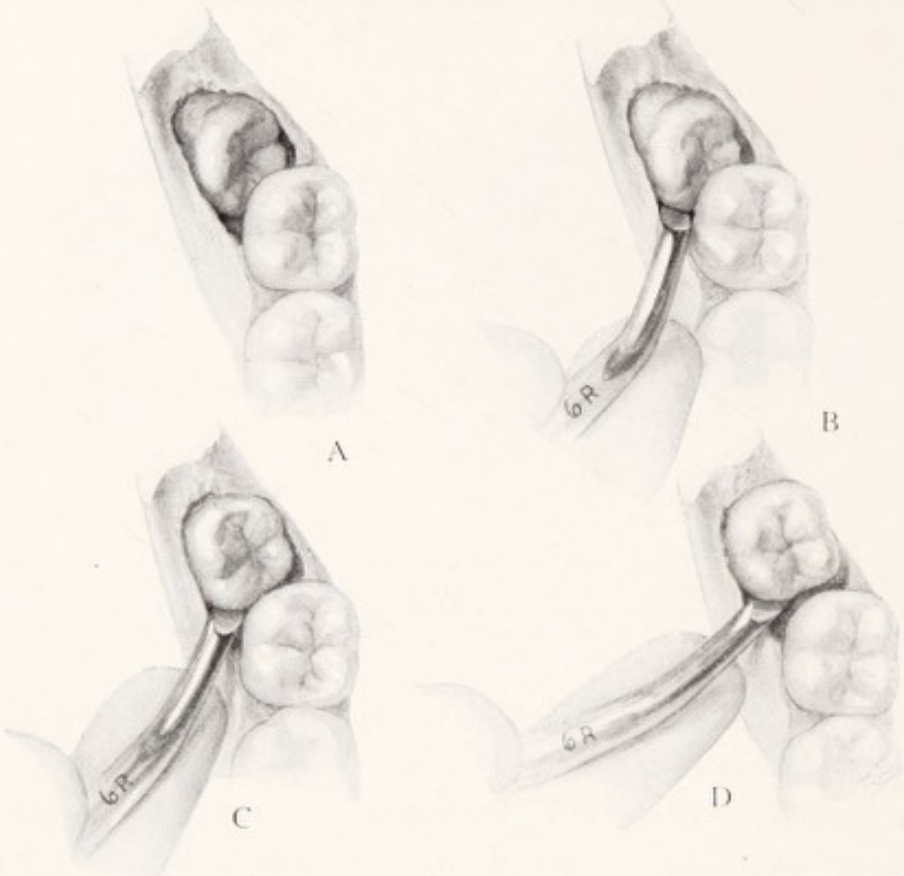


Fig. 565. — Mesiobuccal Application of Exolever—Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Accessible. *A*, pathologic condition along mesiobuccal surface; *B*, exolever No. 6R applied to mesiobuccal surface and blade wedged between mesiobuccal surface and ossistructure; *C*, tooth directed upward to a distance where it has cleared distobuccal surface of second molar by forcing handle downward; *D*, handle directed buccally and blade applied to mesial surface to direct tooth distally and upward out of socket.

face and the superior border of the ossistructure, and with pressure under control the ossistructure is readily excised, as there is usually a space between the occlusal surface and the superior border of the ossistructure and the structure is usually not very dense.

Exolever Technic—Mesial Application.—Where the radiogram shows that there is no marked contact of the third molar with the distobuccal surface of the second, and that there is a slight pathologic

involvement below the mesial surface of the third molar, exolever No. 2L for the left side or No. 2R for the right side is inserted between the mesial surface of the third molar and the superior border of the ossistructure along the mesiobuccal surface, and the exolever technic of directing the tooth upward and distally is followed, as described where there is a buccolingual deflection and the mesial surface is inaccessible (Fig. 583, page 556). Where, however, the deflection is very marked, and there is an extensive pathologic condition along the mesiobuccal surface (Fig. 565 A), exolever No. 6L for the left side or No. 6R for the right side is selected. The gum tissue on the mesiobuccal surface of the third molar is displaced with the back of the blade of the exolever, and the blade is directed along this surface and wedged between the mesiobuccal surface of the third molar, and the ossistructure along this surface (Fig. 565 B). Where the tooth is not extracted by this procedure the handle is then directed downward and the tooth upward to a distance where the mesiobuccal surface of the third molar is clear of the distobuccal surface of the second molar (Fig. 565 C). At this juncture the handle is directed buccally and the blade applied between the mesial surface of the third molar and the ossistructure along the mesiobuccal surface (Fig. 565 D), a movement which should create a wedge. When the tooth is loosened by this procedure, it is directed upward and distally by a downward pressure on the handle of the exolever in order to direct the tooth out of the socket.

Where the roots cause resistance, exolever No. 3L, 4L or 5L for the left side or No. 3R, 4R or 5R for the right side is inserted between the third molar and the superior border of the ossistructure and the tooth is directed upward and distally in conformity with the root formation. If, however, the tooth is not extracted by this procedure, the movement is repeated, and, in case a buccal application is indicated, it may be made with the same exolever, or an exolever specially designed for that purpose, to complete the extraction.

Buccal Application.—When the buccal application is being made with exolever No. 10L for the left side or No. 10R for the right side, the pressure applied with this instrument to the buccal surface of the third molar is liable to force it back to its original position, and, when the exolever movements are attempted, that part of the mesioclusal surface that was in contact with the distobuccal surface of the second molar will again be in contact with the distobuccal surface of that tooth, a position which will prevent the execution of the exolever movements. If this incident occurs, the exolever indicated is readjusted to the mesial surface of the third molar for the purpose of directing the tooth from its contact with the distobuccal surface

of the second molar, when a buccal application is made and the technic is executed as described on page 472.

Distal or Occlusal Application.—Where both roots are inclined mesially (Fig. 576, page 548), a condition that will occur in this type of impaction, and the exolever is applied to the mesial surface to direct the tooth distally, a fracture of the roots may result. As there is usually a slight pathologic involvement below the mesial surface—or, if no pathologic condition is present, a space is created by excising the ossistructure below this surface—pressure is applied with an exolever or any other instrument to the occlusal or distal surface, and the tooth is directed downward, which procedure will often avoid a fracture of the roots, after which the tooth is directed upward and distally by the application of the exolever to the mesial surface, and the extraction is completed by a buccal application.

The technic to be followed, after the distal excision has been made, is to apply the exolever or ossisector blade to the occlusal or distal surface, depending on the part that can be most advantageously used. When the exolever has been securely adjusted, a downward pressure is exerted to fracture the septum between the roots, and the tooth is sent down into the space that has been created by a pathologic condition or excision below the mesial surface.

SUMMARY OF CASES

In the cases shown in Fig. 566, where the mesial root is inclined distally and the distal root is straight, excision of the ossistructure on the distal surface is indicated. The blade of the exolever should be of a size approximately to fit the space between the mesial surface

Fig. 566. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with ossistructure on distal surface extending up to gingival third, and greater part of lingual and buccal surfaces free of ossistructure.

of the third molar and the superior border of the ossistructure, irrespective of the contact of the mesioclusal surface with the distobuccal surface of the second molar. The exolever movement is made upward and distally in conformity with the curvature of the mesial root, but not so far as to fracture the distal root, and the extraction is completed by a buccal application.

In the cases shown in Fig. 567, where the mesial root is inclined distally and the distal root is straight, excision of the ossistructure over the distoclusal surface and on the distal and buccal surfaces is indicated, and the exolever movement is made to direct the third molar upward and distally from its contact with the distobuccal surface of the second molar. Where the third molar has been directed distally and resistance is encountered, an exolever that will approximately fit the space between the second and third molars is adjusted, the second molar being used as a fulcrum, to direct the tooth farther distally in conformity with the root formation, and the extraction is completed by a buccal application.

Fig. 567. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with ossistructure extending over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

In the case shown in Fig. 568, where the roots of the third molar are fused and the ossistructure on the distal surface of the third molar extends up to the gingival third and on the greater part of the buccal surface, excision on the distal surface is indicated. The mesial surface of the third molar is at the gingival third of the second, and the exolever is adjusted to this surface, care being taken not to come in contact with the distobuccal or distal surface of the second molar. The third molar is directed upward and distally far enough, by the adjustment of the exolever to the mesial surface, to overcome any resistance that may be presented, the ossistructure below this surface and not the second molar being used as a fulcrum, and the

Fig. 568. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Accessible. Roots of third molar fused, with ossistructure extending on distal surface up to gingival third and over greater part of lingual and buccal surfaces.

tooth is raised to a point where a buccal application can be made.

In the cases shown in Fig. 569, where the mesial root is inclined distally and the distal root is inclined mesially, with the ossistructure extending up to the gingival third, a slight excision on the distal surface is indicated on account of the root formation. The tooth is directed upward by the application of considerable pressure to the mesial surface, and this should fracture the septum between the roots, when the tooth is directed distally far enough to allow a buccal application. In both of these cases it is not possible to use the second molar as a fulcrum, as in one case the roots of the second molar are fused, while in the other case the gingival third of the second molar is involved by a pathologic condition, and any pressure applied with the exolever to the second molar in either case is liable to loosen or dislodge the tooth.

Fig. 569. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially, with ossistructure on distal surface extending to gingival third; greater part of lingual and buccal surfaces is free of ossistructure.

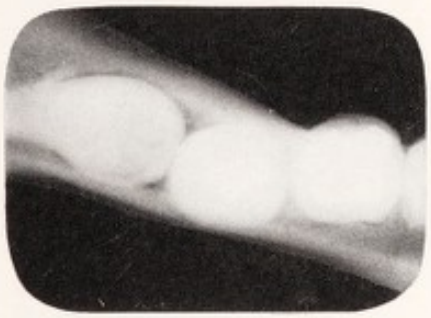
In the cases shown in Fig. 570, where the mesial root is inclined distally and the distal root is inclined mesially, pathologic changes have involved the ossistructure on the mesial, distal, lingual and buccal surfaces. Excisions are made on the distal surface and on the buccal surface distal to the bifurcation to secure a fulcrum, as pathologic changes have involved the ossistructure to such an extent that, unless the latter excision is made, a secure fulcrum cannot be obtained. The exolever, when applied to the mesial surface, is

Fig. 570. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially, with a pathologic condition involving ossistructure on mesial, distal, lingual and buccal surfaces.

securely adjusted, sufficient pressure being applied to fracture the septum between the roots, and the extraction is completed by a buccal application.

In Fig. 571 A is shown a radiogram where the ossistructure on the mesial, distal, lingual and buccal surfaces is not involved by pathologic changes as in the cases shown in Fig. 570. Excision is indicated on the distal surface down to the gingival third, but no excision is indicated on the buccal surface, and the tooth is directed upward and distally from its contact with the distobuccal surface of the second molar and, to overcome the resistance of the septum between the roots, to a distance where extraction is completed by a buccal application. Fig. 571 B shows an occlusal view, and Fig. 571 C shows the socket after extraction.

A



B

C

Fig. 571. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Accessible. Same case. *A*, mesial root inclined distally and distal root inclined mesially, with ossistructure extending over entire distal, lingual and buccal surfaces; *B*, occusal radiogram of case; *C*, radiogram made after extraction.

In the cases shown in Fig. 572, where the mesial root is straight and the distal root is inclined mesially, with a variation in the location of the ossistructure on the distal surface, excision on this surface is indicated on account of the character of the root formation, and is made to a point slightly beyond the gingival third. Excision on the buccal surface distal to the bifurcation is also indicated from the superior border of the ossistructure to a point where a secure fulcrum on the buccal surface at the bifurcation can be obtained. When the exolever is adjusted to the mesial surface of the third molar, the tooth is directed upward and distally from its contact with the distobuccal

surface of the second molar, but not so far as to fracture the straight mesial root, after which a buccal application is made to complete the extraction. When making the buccal application, the blade of the exolever is inserted as a wedge between the buccal surface and the ossistructure on this surface, and this procedure will often aid in loosening the tooth. As there will be a liability of a fracture of the roots, the operator should be prepared to remove any remaining parts.

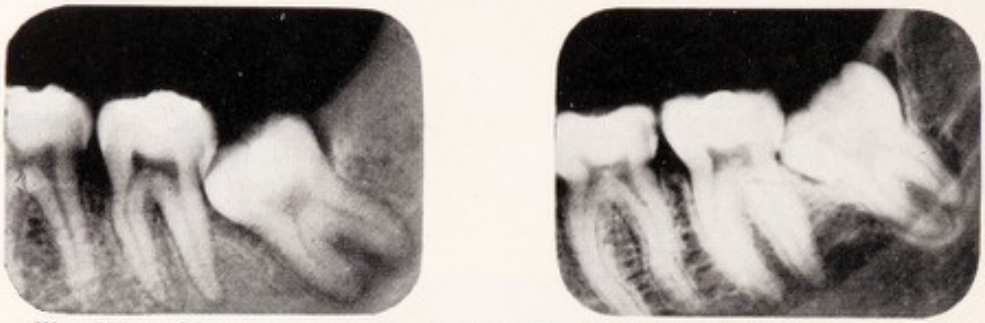


Fig. 572. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Accessible. Mesial root straight and distal root inclined mesially, with a variation in extent of ossistructure on distal, lingual and buccal surfaces.

In the cases shown in Fig. 573, where the mesial root is straight and the distal root is inclined mesially at the apical third, excision on the distal surface is indicated, but no excision is indicated on the buccal surface. The exolever technic is similar to that described for the cases shown in Fig. 572, except that precaution should be taken not to direct the tooth too far distally or one might cause a fracture of the roots, as they are not of large size and are easily fractured.

In the case shown in Fig. 574 A there is no root curvature, but

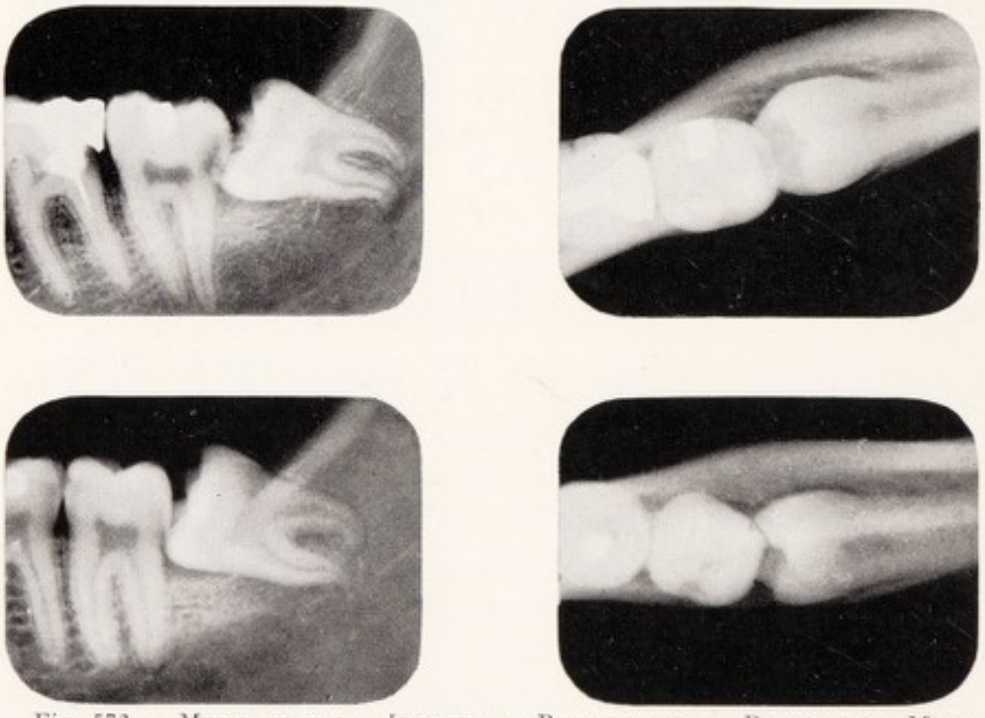


Fig. 573. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Accessible. Lingual and occlusal radiograms of two cases where mesial root is straight and distal root is inclined mesially. The ossistructure on distal surface extends to gingival third and over a part of lingual and buccal surfaces.

both roots are hypercementosed and divergent, with pathologic changes involving the ossistructure on the distal surface. A slight excision is made on this surface to decrease resistance, and excision is made on the buccal surface distal to the bifurcation to secure an adjustment of the exolever. The tooth is directed upward and distally from its contact with the distobuccal surface of the second molar, and the extraction is completed by a buccal application. Increased resistance is encountered where the roots are of a large size and hypercementosed, and repeated buccal applications are necessary to complete the extraction.

In the case shown in Fig. 574 B, where both roots are straight and a pathologic condition has involved the ossistructure on the mesial surface, excision on the distal surface is indicated to free this surface of ossistructure down to the gingival third, and excision on the buccal surface distal to the bifurcation is made to secure a fulcrum. The tooth is directed upward and distally only far enough to remove it from its contact with the distobuccal surface of the second molar, when a buccal application is made to complete the extraction.

A B

Fig. 574. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Accessible. *A*, there is no root curvature, but both roots are hypercementosed and divergent. The ossistructure on distal surface is involved slightly by a pathologic condition and extends over greater part of lingual and buccal surfaces; *B*, both roots straight, with a pathologic condition involving ossistructure on mesial surface.

In the cases shown in Fig. 575, where there is a divergency of the roots, excision of the ossistructure on the distal and buccal surfaces is indicated. Increased resistance will be encountered when the exolever is adjusted to the mesial surface to direct the tooth

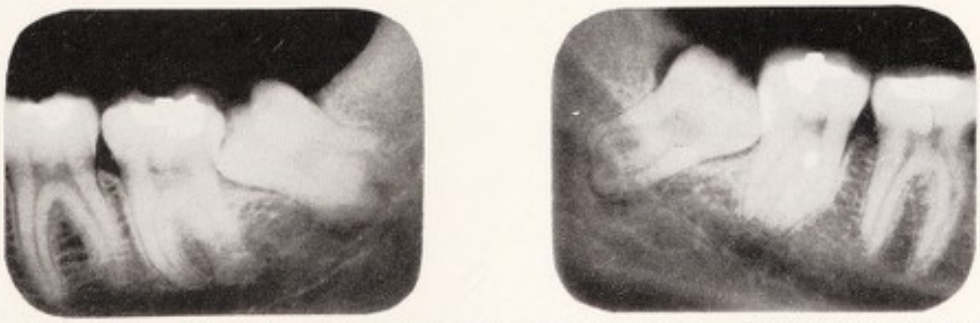


Fig. 575. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Accessible. Both roots divergent, with a variation in extent of ossistructure on distal, lingual and buccal surfaces.

upward and distally from its contact with the distobuccal surface of the second molar, in addition to which there will be a liability of fracturing the roots, and the operator should be prepared to remove any remaining parts if such an incident occurs.

In the cases shown in Fig. 576, where both roots are inclined mesially, with the ossistructure on the distal surface extending up to the gingival third, excision on this surface is indicated to decrease resistance. The pathologic involvement below the mesial surface is not sufficient to permit the tooth to be directed downward. An excision below the mesial surface is indicated, and, if an exolever or ossisector is adjusted to the occlusal or distal surface, pressure being exerted downward, the tooth will be sent into this space, and the septum between the roots fractured when the tooth is partially loosened. The exolever indicated for a mesial application is then applied to direct the tooth upward and distally, and a fracture of the roots during such a procedure will seldom occur, but precaution should be taken to apply the exolever to the buccal surface at the bifurcation to complete the extraction after the tooth has been directed distally and upward from its contact with the distobuccal surface of the second molar.

Fig. 576. — Mesioangular Impaction—Buccal Deflection—Mesial Surface Accessible. Both roots inclined mesially, with ossistructure on distal surface extending up to gingival third and over greater part of lingual and buccal surfaces.

In the cases shown in Fig. 577, where there is a variation in the root formation and the ossistructure on the distal surface is extensively involved by a pathologic condition, no excision would be indicated, but a solid ledge is usually found over the distolingual surface where excision is indicated. After the excision described above has been

Fig. 577. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Accessible. There is a variation in root formation, with a pathologic condition of ossistructure on distal surface.

made, the tooth is directed distally from its contact with the distobuccal surface, and the extraction is completed by a buccal application.

BUCCOLINGUAL DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

A very common type of mesioangular impaction is where the occlusal surface of the third molar is deflected to a slight extent lingually and a part of the mesioclusal surface is in contact with the distobuccal surface of the second molar or the distal root of this tooth, and where the buccal surface of the third molar is deflected to a slight extent buccally out of alignment with the distobuccal surface of the second molar, with the mesial surface of the third molar inaccessible to the application of the exolever (Fig. 578). In the majority of these

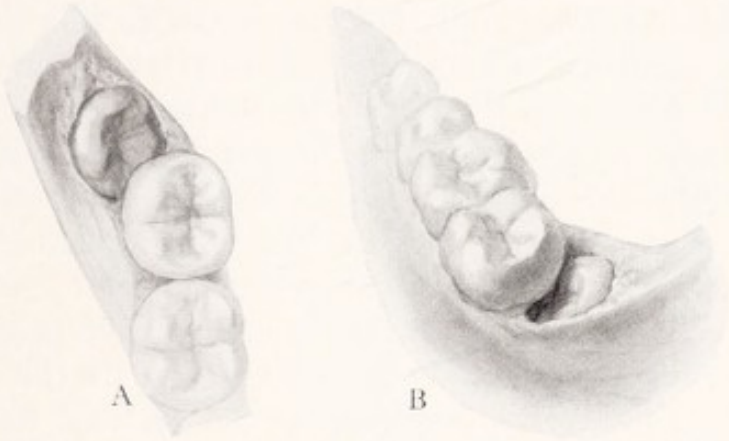


Fig. 578. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. *A*, illustration of a buccolingual deflection, anterior view; *B*, posterior view.

cases the contact is at the gingival third of the second molar, but, when the contact is below this point and involves the distal root, it is not unusual to find an absorption due to pressure of the third molar, as this part of the second molar will not withstand any considerable pressure, and consequently this tooth is often lost as a result of a too long retention of the impacted tooth. When the contact is at the middle third of the distal root of the second molar, the pressure of the third molar at this point often causes a loss of contact between the first and second molars, with the result that there is a pathologic involvement of the interseptum between the latter two teeth.

CLINICAL EXAMINATION

Exposed Crown.—The greater part of the crown is usually covered by gum tissue, but, if there is any exposure, it is usually a part of the distoclusal surface.

Gum Tissue.—The description above in regard to the exposed crown will apply to the condition of the gum tissue.

RADIOGRAPHIC INTERPRETATION

Crown.—A part of the occlusal surface of the third molar is visible in the radiogram, but no part of the occlusal surfaces of the first and second molars is shown, and both of these teeth show definite enamel caps and pulp chambers, a condition which indicates a lingual deflection of the third molar. The contact of a part of the mesioclusal surface of the third molar with the distobuccal surface of the second shows an overlap, indicating a buccal deflection of the third molar, and a checking up of the contact point between the first and second molars, which is approximately normal, will verify the diagnosis of a buccal deflection. The lingual and buccal deflections of the third molar constitute a buccolingual deflection. It has always been difficult to extract the third molar in this type of impaction on account of the buccolingual deflection.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root straight, 10; mesial root inclined distally and distal root inclined mesially, 7; fused roots, 7; both roots inclined distally, 5; divergent roots, 3; partially developed roots, 2, and mesial root straight and distal root inclined mesially, 2.

Ossistructure.—The mesial surface is inaccessible to the immediate application of the exolever, and the ossistructure on the distal surface extends, in the majority of cases, up to the occlusal surface. Occasionally slight and on rare occasions extensive pathologic changes may affect the ossistructure on the distal surface, but pathologic changes do not frequently involve the ossistructure on the mesial surface. The ossistructure on the buccal surface usually extends beyond the gingival third, varying in its location from this point up to the occlusal surface, but in the majority of cases the ossistructure extends up to the occlusal surface and is not, as a rule, involved by pathologic changes. Occasionally the ossistructure extends over the buccal or lingual half, and, in an extremely rare case, over the entire occlusal surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—As the gum tissue usually covers the greater part of the crown, the operator should determine the extent of the buccal deflection of the tooth and at the same time locate the external oblique ridge. The bulge in the region of the third molar will usually indicate the approximate position of the tooth, and this information, together with the radiographic interpretation, will determine the extent of the deflection. The part of the mesioclusal surface of the

third molar that may be in contact with the distobuccal surface of the second will vary from a slight extent to a point where the contact extends on the buccal surface to the bifurcation. The incision is started on the distobuccal surface of the second molar, being governed by the extent of the contact of the mesioclusal surface of the third molar with the distobuccal surface of the second. Usually the contact extends on the buccal surface of the second molar to the bifurcation, and in such a case the incision is made slightly anterior to the bifurcation, and this will leave sufficient gum tissue for a flap when excision is made downward with the ossisector to excise the ossistructure on the mesiobuccal surface. A second incision is made from the distobuccal surface of the second molar buccally and distally, a procedure which will permit excision of the ossistructure on the distal and buccal surfaces, allowing the application of the exolever to the buccal surface. In addition to these two incisions, a slight incision is made of the gum tissue around the distobuccal surface of the second molar, so that this tissue will not be injured when the third molar is directed out of its socket. The incision is similar to that described for a mesioangular impaction, where there is buccolingual deflection and the mesial surface is accessible (page 537).

Ossistructure Technic—Distal Excision.—The internal and external oblique ridges are determined by palpation, and the distal surface will usually be found between these ridges, precaution being taken to keep the excision in line with the alignment of the distal surface of the third molar (Fig. 564, page 539). Excision is made with ossisector No. 2L or 3L for the left side or No. 2R or 3R for the right side, and the ossistructure is excised down to the gingival third. When the gum tissue on the buccal surface is displaced with the back of the blade to direct the blade distally, some idea can be gained as to the alignment of the buccal surface. If the radiogram shows a slight pathologic involvement on the distal surface, the blade is inserted between the distal surface and the ossistructure on this surface, and this will give the operator a guide for further excision. The excision is extended toward the distal surface, and is continued down to the gingival third. Where the ossistructure is not involved by a pathologic condition and extends over the entire distal surface, the excision is started with ossisector No. 5L or 5R and sufficient structure is excised to determine the location of the distal surface, as the structure in these cases extends up to the occlusal surface, care being taken to excise only the structure on the distal surface.

Mesiobuccal Excision.—The approach with the ossisector for excising the ossistructure to gain access with the exolever to the mesial surface of the third molar is made on the mesiobuccal surface, and,

as it is not unusual to find a space between the mesiobuccal surface and the ossistructure on this surface, ossisector No. 6L for the left side or No. 6R for the right side is indicated for this excision. The blade is directed downward, in line with the mesiobuccal surface of the third molar, with the anticipation that there may be a space which will allow the blade to be sent down to the mesial surface (Fig. 579). If it is found that such a space exists and the roots are not large and have no large septum between them, the blade is sent down on the mesiobuccal surface until the mesial surface is reached, when the instrument is used cautiously as an exolever. If, however, no such space exists, and the superior border of the ossistructure will not per-

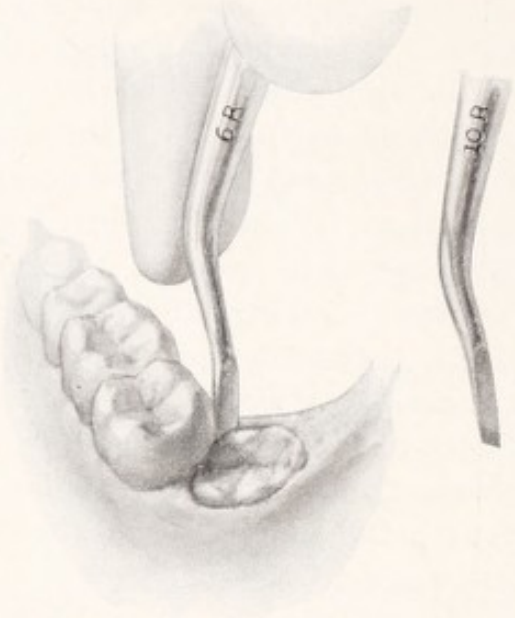


Fig. 579. — Mesiobuccal Excision of Ossistructure—Mesioangular Impaction—Mesial Surface Inaccessible—Buccolingual Deflection. Ossisector No. 6R applied as a pathfinder to mesiobuccal surface to determine whether there is a space present, and, when no space exists, excision is indicated with ossisector No. 10R, also shown, which instrument is applied in same manner as ossisector No. 6R.

mit the blade of the ossisector mentioned above to reach the mesial surface, the excision is started at the superior border with ossisector No. 10L for the left side or No. 10R for the right side. In following this procedure the operator should bear in mind the alignment of the mesiobuccal surface, and excise from the superior border of the ossistructure to a point a short distance above the mesial surface of the third molar, being careful not to come in contact with the distal root of the second molar.

As the third molar is deflected buccolingually, with a part of the mesioclusal surface in contact with the distobuccal surface of the second molar, excision anterior to the occlusal surface cannot be made as in the case of a buccal deflection, and, in order to reach the mesial surface, excision on the mesiobuccal surface of the third molar is indicated.

Occlusal Excision.—In an occasional case the ossistructure extends over the buccal fourth or half of the occlusal surface; the excision of the structure is made with ossisector No. 8L or 9L for the left side or No. 8R or 9R for the right side. The excision may be a continuation of the distal excision or may be started at the point of contact of the third with the second molar (Fig. 580). The gum tissue over the occlusal surface is displaced with the back of the blade of the ossisector, and excision is made toward the occlusal surface. Where the external oblique ridge does not extend along the buccal surface, excision is readily made, but when it does extend along this surface, the difficulty of excision is increased. Where the ossistructure extends over the lingual fourth or half of the occlusal surface, excision is made

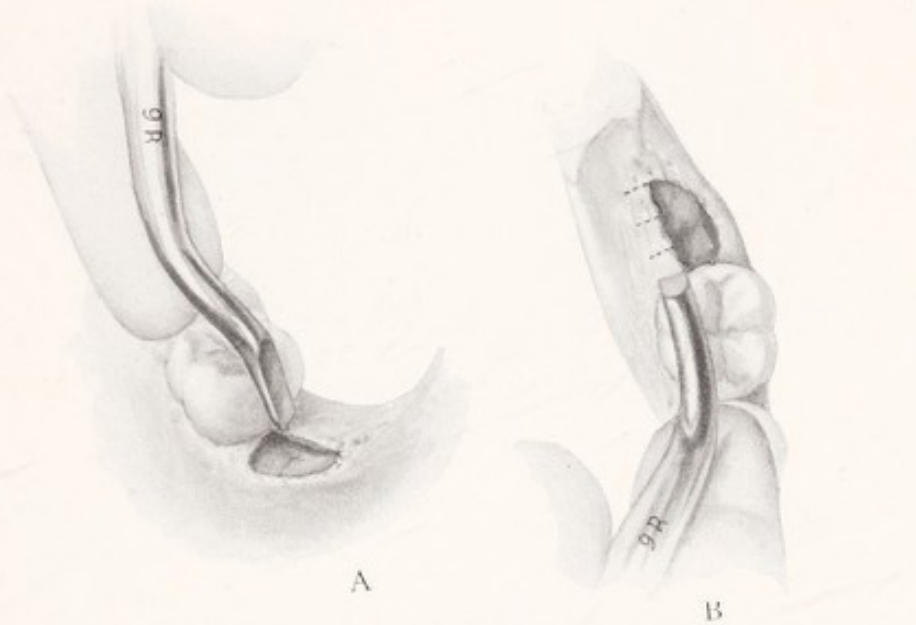


Fig. 580. — Excision of Ossistructure over Buccal Half of Occlusal Surface—Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 9R, viewed posteriorly, applied for excision of ossistructure over buccal half of occlusal surface; *B*, application of same technic, viewed from occlusal.

between the occlusal surface and the superior border of the ossistructure. The latter excision is made with ossisector No. 11L or 11R, and the back of the blade is used to displace the gum tissue over the occlusal surface. The blade is applied between the occlusal surface and the superior border of the ossistructure (Fig. 581), as there is usually a space, and pressure is applied toward the structure to be excised. No ossistructure should be permitted to remain at this point, as any remaining ledges will interfere with the exolever movements.

Buccal Excision Distal to Bifurcation.—Excision is made on the buccal surface distal to the bifurcation where the root formation indicates such a procedure. As the external oblique ridge is always in close proximity to the distal and buccal surfaces, the precaution should

be taken not to excise this structure instead of the ossistructure on the buccal surface.

By the interpretation of the radiogram the extent to which the tooth may be directed distally and upward, in conformity with the root formation, can be approximately determined. Ossisector No. 11L for the left side or No. 11R for the right side is selected for this purpose, excision being made from the superior border of the ossistructure down to a point a short distance above the gingival third, an excision which will be sufficient to allow the application of the exolever at the bifurcation. When the excision of the ossistructure on the buccal surface is being made, the blade should at all times be under complete control. The operator should take into consideration

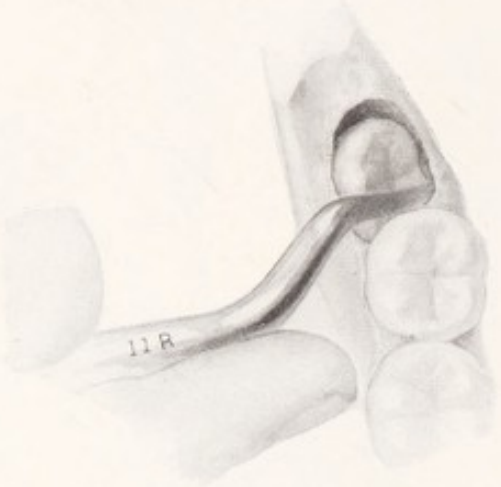


Fig. 581.—Excision of Ossistructure over Lingual Half of Occlusal Surface—Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Ossisector No. 11L applied for excision of ossistructure over lingual half of occlusal surface.

the buccolingual deflection of the tooth, and have reason to feel that it is not difficult to excise the ossistructure on the buccal surface down to a point a short distance above the gingival third, determining at the same time whether there is enough space to allow an exolever blade to be adjusted. Where no space exists between the buccal surface and the ossistructure on this surface, excision is made by directing the blade toward the buccal surface.

In Fig. 582 A is shown the blade of ossisector No. 11R applied distally to the bifurcation after the ossistructure has been excised on the distal, mesiobuccal and over the lingual fourth of the occlusal surface. In Fig. 582 B is shown the third molar clear of its contact with the second molar after it has been directed upward and distally with the exolever when applied to the mesial surface to a point at which the excised area on the buccal surface is in line with the bifurcation of the third molar.

Exolever Technic—Mesial Application.—When executing the exo-

lever technic, precaution should be taken not to force the third molar against the distobuccal surface of the second, as there is a liability of loosening the latter tooth. An upward and distal movement is always made away from and not toward the second molar. There is no liability, when directing the tooth upward and distally, of the mesioclusal surface of the third molar coming in contact with the distobuccal or distal surface of the second. If the operator is not certain of his technical procedure, he may reinforce the crown of the second molar with one of the fingers of the left hand during the application of the exolever. The part of the mesioclusal surface of the third molar that is deflected toward the distobuccal surface of the second should be observed when adjusting the exolever, which is directed down on the

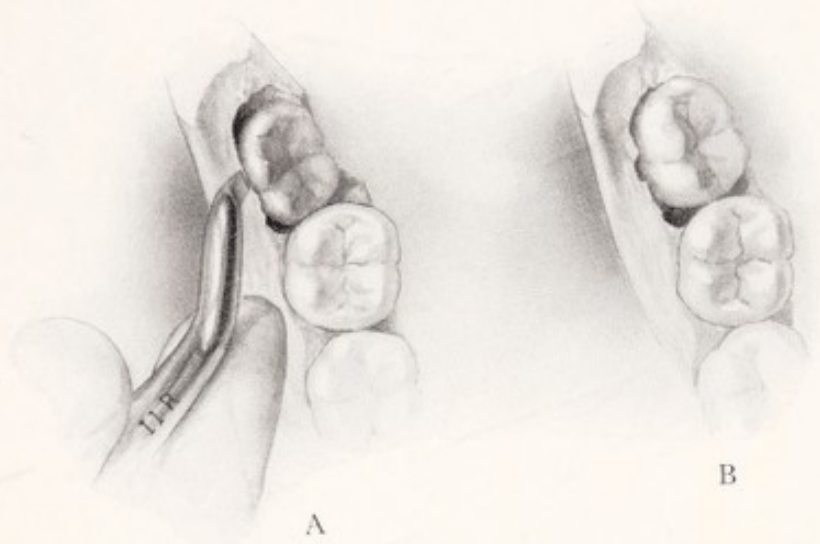


Fig. 582. — Buccal Excision of Ossistructure—Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 11R applied for a buccal excision distal to bifurcation, where ossistructure has been excised on distal and mesiobuccal surfaces and over lingual fourth of occlusal surface; B, third molar clear of its contact with second molar after it has been directed upward and distally with exolever to point where excised area on buccal surface is in alignment with bifurcation.

mesiobuccal surface until the mesial surface has been reached, where there will be an ideal fulcrum to support the exolever if the angle of approach has been properly made. Where ossisector No. 6L or 6R has been used to excise for access to the mesial surface and the roots are not large and cause no resistance, the ossisector can be used as an exolever and the tooth directed upward from its contact with the distobuccal surface of the second molar (Fig. 579, page 552). Where the foregoing technic is not practicable, on account of the character of the root formation, the exolever is then indicated. Exolever No. 2L for the left side or No. 2R for the right side is selected for the application. The gum tissue on the mesiobuccal surface is displaced with the back of the blade, and the blade, with the flat side against the mesiobuccal surface, is sent down to the mesial surface. The handle is then directed

buccally, and at the same time the blade is wedged between the mesial surface and the superior border of the ossistructure, which in most instances is the external oblique ridge. If the wedge movement has been properly made and the roots are not large the tooth is usually loosened and extracted, or raised to a distance where a buccal application is readily made to complete the extraction. Where resistance is encountered, the handle of the exolever is directed farther downward, and, when the tooth has cleared the distobuccal surface of the second molar the handle is turned mesially, a movement which will direct the tooth upward and distally to a point where exolever No. 3L

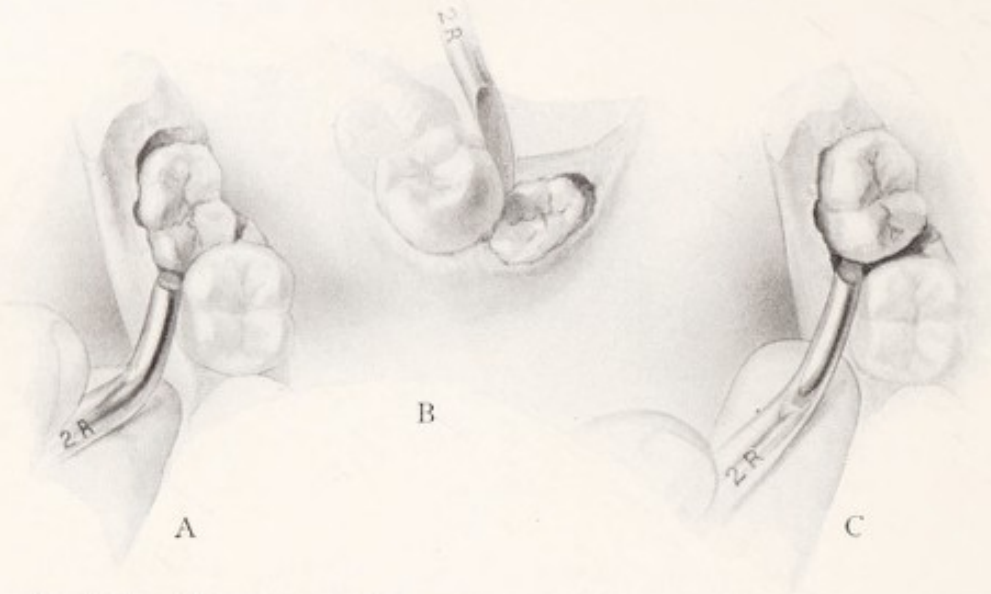


Fig. 583. — Mesiobuccal Application of Exolever—Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. *A*, exolever No. 2R applied to mesiobuccal surface after excision has been made on distal, mesiobuccal and buccal surfaces distal to bifurcation and over lingual half of occlusal surface; *B*, instrument as applied, viewed posteriorly; *C*, tooth directed upward and distally by pressure applied upward with flat side of blade to mesial surface and rounded surface resting upon superior border as a fulcrum. The tooth has been directed distally and upward to a point where it has cleared distal surface of second molar, and where tooth can be directed farther upward and distally out of its socket with exolever No. 3R to improve fulcrum or by application of exolever No. 10R on buccal surface at bifurcation to complete extraction.

for the left side or No. 3R for the right side can be adjusted to direct the tooth farther upward and distally. If resistance is encountered at this point, exolever No. 4L or 6L for the left side or No. 4R or 6R for the right side, depending on the available space, is sent down on the mesiobuccal surface and is inserted between the mesial surface and the superior border of the ossistructure, when the tooth is directed upward and distally out of its socket, the superior border being utilized as a fulcrum if the roots indicate such a procedure, but, if it is found that a buccal application is indicated, such an application is made to complete the extraction.

In Fig. 583 A is shown exolever No. 2R, viewed from the occlusal and applied to the mesiobuccal surface, in order to be directed below

the mesial surface where excision has been made in alignment with the distal surface over the lingual half of the occlusal surface, on the buccal surface distal to the bifurcation and on the mesiobuccal surface. Fig. 583 B shows a posterior view of the alignment of the instrument when properly applied; Fig. 583 C shows the tooth directed upward and distally, with the flat side of the exolever adjusted to the mesial surface and the rounded side resting upon the superior border of the ossistructure as a fulcrum. The tooth has been directed upward and distally to a point where it has cleared the distal surface of the second molar and exolever No. 3R can be applied to improve the fulcrum to direct the tooth out of its socket, or a buccal application can be made to complete the extraction.

Buccal Application.—When the buccal application is being made with exolever No. 10L for the left side or No. 10R for the right side, the pressure downward to create a wedge between the buccal surface at the bifurcation and the ossistructure on this surface should be made cautiously so as not to force the tooth back to its original position. The application of the exolever to the mesial surface of the third molar is made to direct the tooth upward and distally far enough to clear the distobuccal surface of the second molar, and the application of the exolever to the buccal surface is made to bring the tooth upward out of its socket. If, during the adjustment of the exolever to the buccal surface at the bifurcation, it is observed that the tooth has been forced back to a position where, when the buccal application is made, the mesioclusal surface will again come in contact with the distobuccal surface of the second molar, the exolever is withdrawn and an application is made to the space available on the mesial surface, when the tooth is again directed upward and distally from its contact with the distobuccal surface of the second molar. A buccal application is again made, and the blade is sent down on the buccal surface to a point where a secure fulcrum can be obtained, when the tooth is directed out of its socket by an upward movement which is accomplished by pressing the handle of the exolever downward and turning it to a slight extent buccally, as described on page 472.

SUMMARY OF CASES

In the cases shown in Fig. 584 both roots are inclined distally and the ossistructure extends entirely over the mesial, distal, lingual and buccal surfaces. Excision of the ossistructure on the distal surface down to the gingival third is indicated, and on the buccal and mesiobuccal surfaces excision is indicated to allow the application of the exolever to the mesial and buccal surfaces. Excision is also indicated over the mesiolingual half of the occlusal surface. The operator should not direct the tooth with the exolever, when adjusted

to the mesial surface, as far upward and distally as is indicated by the root formation, as he should depend to some extent on a buccal application, after the tooth has been loosened and directed upward and is distal for a sufficient distance to clear the distobuccal surface of the second molar.

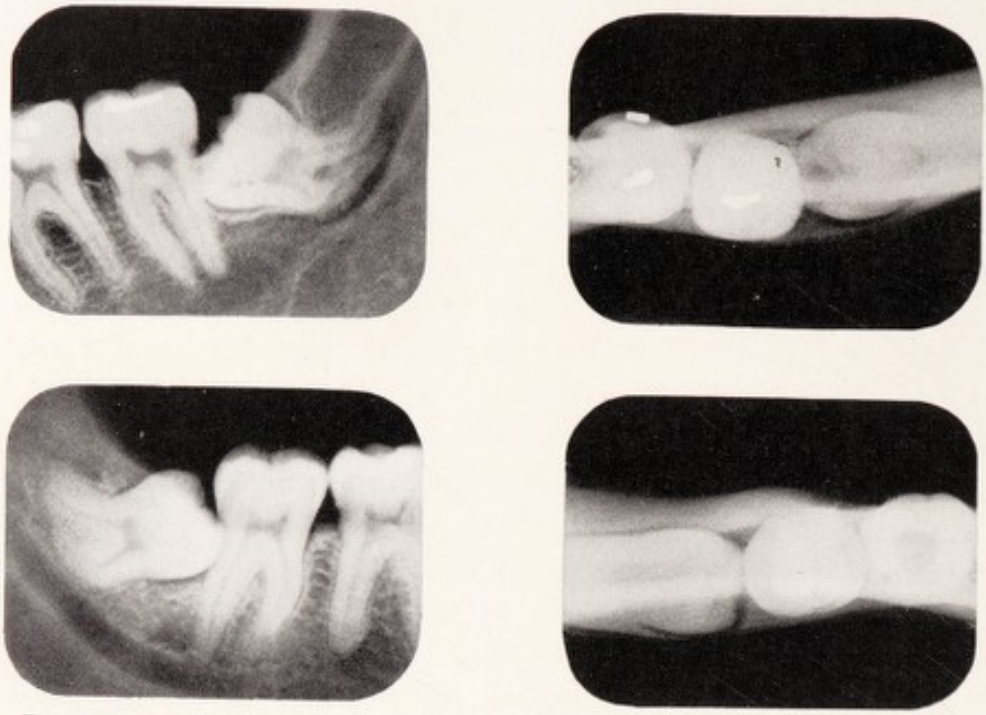


FIG. 584. — MESIOANGULAR IMPACTION—BUCCOLINGUAL DEFLECTION—MESIAL SURFACE INACCESSIBLE. Both roots inclined distally, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces, and over mesiolingual fourth of occlusal surface.

In the cases shown in Fig. 585, where the mesial root is inclined distally and the distal root is straight, with the ossistructure extending entirely over the mesial, distal, lingual and buccal surfaces, and with a slight pathologic involvement on the distal surface, excision on this surface down to the gingival third is indicated. No excision on the buccal surface is indicated to allow a buccal application of the exolever at the bifurcation, and excision on the mesiobuccal surface is indicated to permit access to the mesial surface. The bifurcation of the roots is quite a distance from the superior border of the

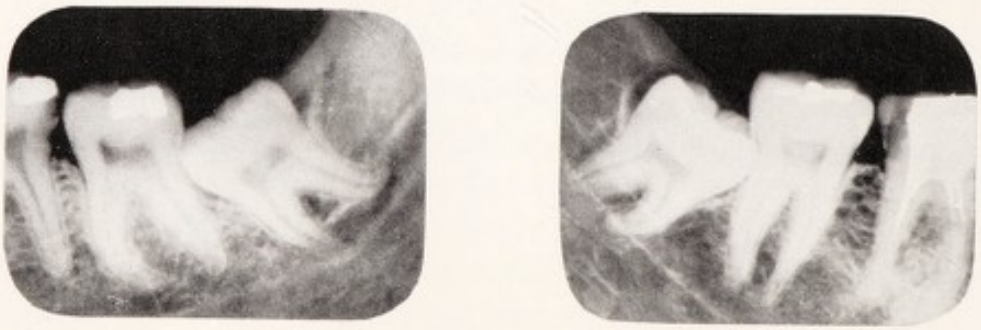


Fig. 585. — MESIOANGULAR IMPACTION—BUCCOLINGUAL DEFLECTION—MESIAL SURFACE INACCESSIBLE. Mesial root inclined distally and distal root straight. The ossistructure extends over entire mesial, distal, lingual and buccal surfaces, with a slight pathologic condition involving distal surface.

ossistructure, but there should be no difficulty in securing a buccal application after the tooth has been directed upward and distally out of its socket, by the application of the exolever to the mesial surface, as far as the straight distal root will permit without fracture.

The case shown in Fig. 586, where the mesial root is inclined distally and the distal root is straight, with the ossistructure extending entirely over the mesial, distal, lingual and buccal surfaces, is treated like the cases described in Fig. 585.

A B

Fig. 586. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Same case. *A*, mesial root inclined distally and distal root straight, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces; *B*, occlusal radiogram of case.

In the cases shown in Fig. 587, where the mesial root is inclined distally and the distal root is straight and fused, with the ossistructure extending entirely over the mesial, distal, lingual and buccal surfaces, and over the mesiolingual half of the occlusal surface, excision is indicated on the distal and mesiobuccal surfaces, and over the mesiolingual half of the occlusal surface. The exolever, when applied to the mesial surface, will not encounter a great deal of resistance when directing the tooth upward and distally, and the extraction is then completed by a buccal application.

In the cases shown in Fig. 588, where the mesial root is inclined distally and the distal root is straight, with a marked divergency of the roots, the excision of the ossistructure is made as in the case described in Fig. 587. In addition an excision is made on the buccal surface distal to the bifurcation. There will also be considerable

Fig. 587. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root straight, both roots being fused. The ossistructure extends over entire mesial, distal, lingual and buccal surfaces, and over mesiolingual fourth of occlusal surface.

resistance when applying the exolever to the mesial surface, and a buccal application should not be attempted until the tooth has been sufficiently loosened by applying the exolever to the mesial surface of the third molar and that part of the crown that was in contact with the distobuccal surface of the second molar has been directed upward and distally for a sufficient distance to clear the distobuccal surface of this tooth.

Fig. 588. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root straight, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces, and over mesiolingual half of occlusal surface.

In the cases shown in Fig. 589, where the roots are fused, with the ossistructure extending on the entire mesial surface and on the greater part of the distal and buccal surfaces, excision on the distal and mesiobuccal surfaces is indicated. No excision is indicated for a buccal application. Where the roots of the second molar are fused, the precaution against coming in contact with this tooth with the exolever blade, when adjusted to the mesial surface to direct the tooth upward and distally, should be observed, as this tooth can be readily dislodged. The extraction is completed by a buccal application.

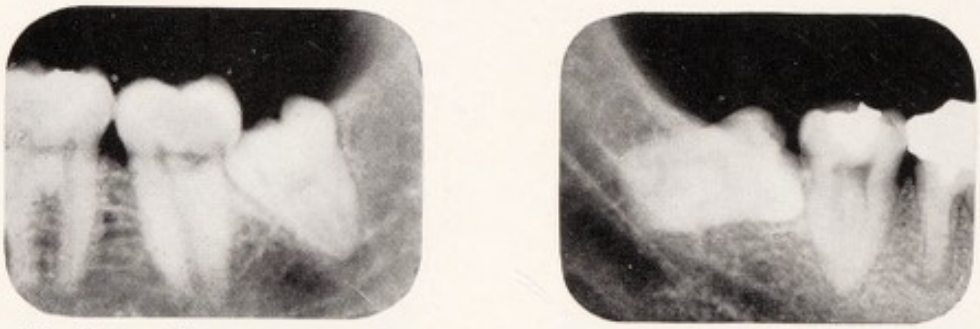


Fig. 589. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Roots fused, with ossistructure extending over entire mesial and greater part of distal, lingual and buccal surfaces.

In the cases shown in Figs. 590, 591 and 592, where the mesial root is inclined distally and the distal root is inclined mesially, with a variation in the size of the septum between them, extensive excision on the distal surface down to the gingival third is indicated. Excision on the buccal surface is not necessary in order to make a buccal application, and excision on the mesiobuccal surface is made to allow

Fig. 590. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially, with ossistructure extending over entire mesial and greater part of distal, lingual and buccal surfaces.

Fig. 591. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially, with a septum. The ossistructure extends over entire mesial, distal, lingual and buccal surfaces.

Fig. 592. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially, with a septum. The ossistructure extends over entire mesial, distal, lingual and buccal surfaces.

adjustment of the exolever to the mesial surface. When the adjustment of the exolever has been made to the mesial surface, the tooth is directed upward and distally, with pressure under control, to a point where the part of the crown in contact with the distobuccal surface is clear of the distobuccal surface of the second molar. When the blade of the exolever is adjusted between the superior border of the ossistructure and the mesial surface of the third molar, the pressure should be sufficient to fracture the septum between the roots, after which the extraction is completed by a buccal application.

In the cases shown in Fig. 593, where the mesial root is straight and the distal root is inclined mesially, excision of the ossistructure on the distal surface is indicated on account of the root formation. Excision is also indicated on the mesiobuccal and buccal surface

distal to the bifurcation and over the mesiolingual half of the occlusal surface. The tooth is directed upward and distally by the application of the exolever to the mesial surface, and this movement should be very cautiously made so as not to fracture the mesial or distal root, The excision of the ossistructure on the distal surface should be quite extensive in order to decrease resistance, and, when applying the exolever to the mesial surface, the operator should be certain that the mesioclusal surface of the third molar is clear of the distobuccal surface of the second before the application of the exolever is made to the buccal surface. When the exolever is adjusted to the mesial surface, the straight mesial root and the distal root inclined mesially should not prevent the operator from executing the upward and distal extraction movement with considerable force, especially if the mesial root is large, as the roots are seldom fractured. The object is to direct the third molar distally to a point where the mesiobuccal surface will be clear of the distal surface of the second molar, so that a buccal application of the exolever can be made to complete the extraction.

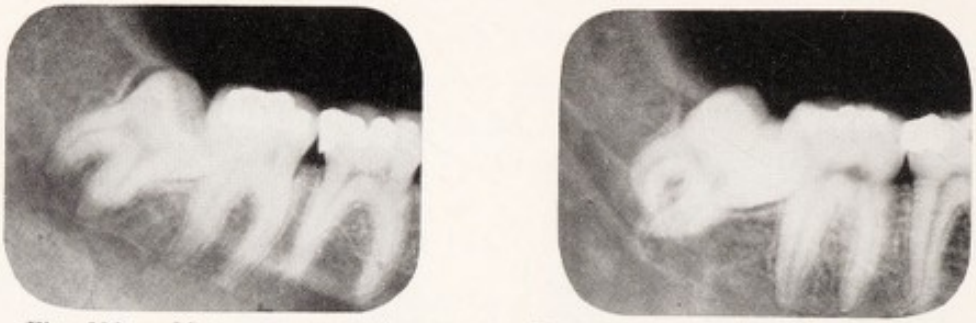


Fig. 593. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Mesial root straight and distal root inclined mesially, with ossistructure extending over entire mesial and distal and greater part of lingual and buccal surfaces.

In the cases shown in Fig. 594 there is a variation in the character of the root formation, and the ossistructure extends over the buccal and lingual half of the occlusal surface. Excision over the buccal and lingual half of the occlusal surface is made in advance of the excision on the distal, mesiobuccal and buccal surfaces. The exolever technic is executed in conformity with the root formation.

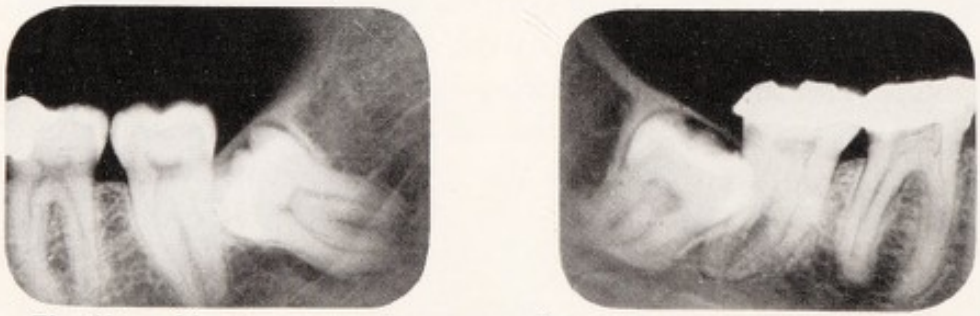


Fig. 594. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. There is a variation in root formation, with ossistructure extending over buccal and lingual half of occlusal surface and entire mesial, distal, lingual and buccal surfaces.

In the cases shown in Fig. 595 it is not unusual to find an absorption of the distal root of the second molar due to pressure of the third molar, and, in addition to this condition, there is an involvement of the interseptum between the first and second molars. Any pressure exerted on the second molar is liable to loosen this tooth or force it out of its socket. It has been the experience of the author in these cases that, even when the impacted tooth has been successfully extracted, the life of the second molar is short, as part of the distal surface of the distal root is absorbed and the involvement of the interseptum between the first and second molars, when extensive, does not always respond to treatment.

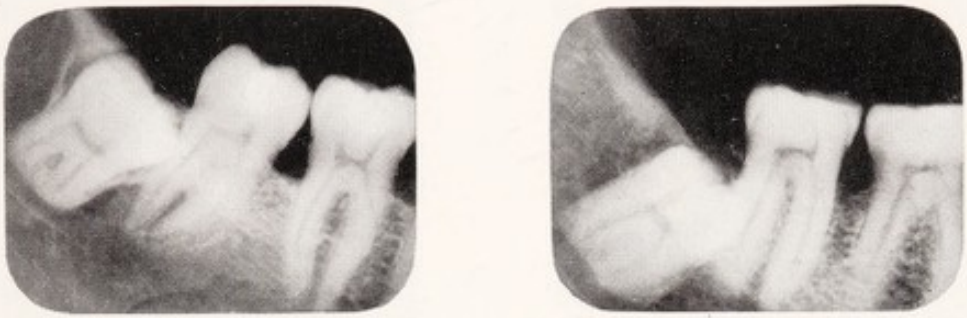


Fig. 595. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. There is a variation in root formation. The ossistructure extends over entire mesial, distal, lingual and occlusal surfaces, with a pathologic condition involving interseptum between first and second molars.

In the cases shown in Fig. 596, where there is a variation in the character of the root formation, with the ossistructure extending over the entire occlusal surface, and where it can be positively determined that the distal surface of the distal root of the second molar is not absorbed, indicating that this tooth can be retained, excision is made over the entire occlusal surface and on the distal, mesiobuccal and buccal surfaces. The exolever technic should be executed in a manner that will not endanger the second molar.

In the case shown in Fig. 597 A the mesial root is inclined distally and the distal root is straight, with the ossistructure extending over the entire tooth. The interseptum between the first and second molars is slightly involved by a pathologic condition, with the contact

Fig. 596. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. There is a variation in root formation, with ossistructure extending over entire tooth.

of the third molar at the middle third of the distobuccal surface of the fused root of the second molar. Excision of the ossistructure on the distal surface is made to the gingival third on the mesiobuccal surface, and over the buccal and lingual half of the occlusal surface. When the exolever is adjusted to the mesial surface to direct the tooth upward and distally, the blade should not come in contact with the second molar, as that tooth can be readily dislodged owing to the

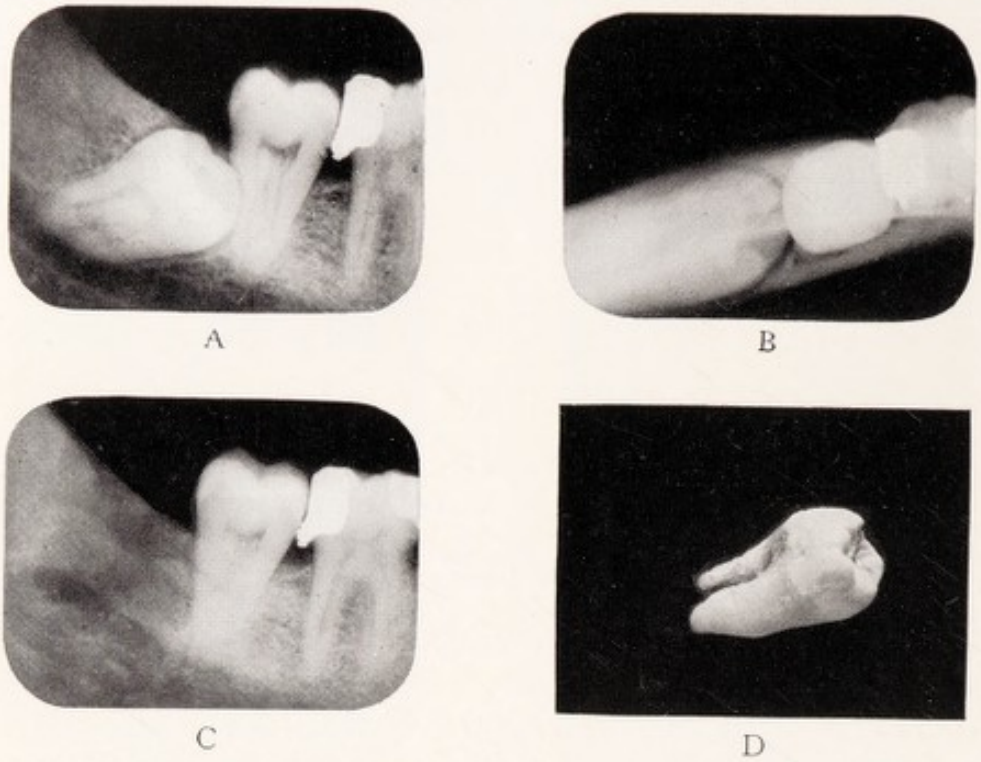
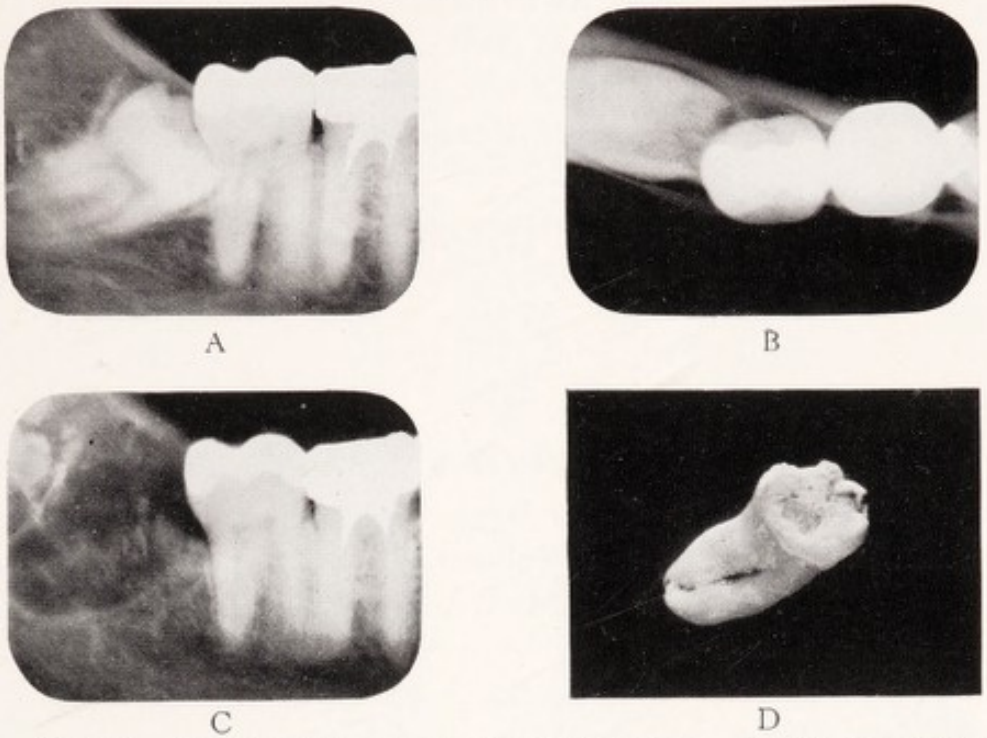


Fig. 597. — Mesioangular Impaction — Buccolingual Deflection — Mesial Surface Inaccessible. Same case. *A*, mesial root inclined distally and distal root straight and fused, with ossistructure extending over entire tooth. Roots of second molar fused and contact of third molar is at middle third of distobuccal surface of distal root of second; *B*, occlusal radiogram, showing alignment; *C*, radiogram made after extraction; *D*, photograph of extracted tooth.

fusion of the roots. The occlusal radiogram (Fig. 597 B) shows the alignment of the tooth; and in the radiogram made after extraction (Fig. 597 C) is shown the condition of the distal root where the crown of the third molar was in contact with the second; also the evidence that no disturbance of the second molar followed the extraction; and in Fig. 597 D is shown a photograph of the extracted tooth.

In the case shown in Fig. 598 A, where the mesial root is inclined distally and the distal root is straight, the ossistructure extends over the entire tooth, and excision is indicated over the entire occlusal, distal and mesiobuccal surfaces. In the occlusal radiogram (Fig. 598 B) the contact of the mesioclusal surface of the impacted tooth is shown to extend over the greater part of the distobuccal surface of the second molar. The operator can determine from this radiogram the exact location of excision over the various surfaces, and also the

location for the application of the exolever to the mesiobuccal surface. Excision on the buccal surface distal to the bifurcation is not indicated in this type of case, as the tooth can be directed out of its socket by the application of the exolever to the mesial surface to a distance where a buccal application can be made to complete the extraction. In Fig. 598 C is shown the case after extraction; in Fig. 598 D is shown a photograph of the extracted tooth.



A B C D

Fig. 598. — Mesioangular Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Same case. *A*, mesial root inclined distally and distal root straight, with ossistructure extending over entire tooth; *B*, occlusal view, showing alignment; *C*, radiogram made after extraction; *D*, photograph of extracted tooth.

TORSIONAL DEFLECTION, WITH THE SURFACE THAT WOULD NORMALLY BE THE MESIAL SURFACE ACCESSIBLE

A case where the third molar is in a mesioangular position, with a torsional deflection and where the surface that would normally be the mesial is accessible, is not a common type of impaction, and such a case is not so frequently seen as where mesial surface is inaccessible.

CLINICAL EXAMINATION

Exposed Crown.—A part of the crown is usually exposed, and an examination of the occlusal surface of the third molar should be made to determine the alignment with the corresponding surface of the second. The gum tissue over the crown is displaced and the buccal groove is located in order to determine, if possible, the location of the bifurcation.

Gum Tissue.—The gum tissue usually extends over part of the crown.

RADIOGRAPHIC INTERPRETATION

Crown.—The first and second molars are shown in normal position, with no overlap at the contact point between these two teeth, which have well-defined enamels caps and pulp chambers. The occlusal surface of the third molar shows an indefinite cusp formation with no definite enamel cap or pulp chamber.

Roots.—As a rule, no positive definition of the root formation can be obtained from the radiogram on account of the torsional deflection of the tooth. The roots will often have the appearance of being fused, and when the tooth is extracted there will be two well-defined bifurcated roots.

Ossistructure.—The ossistructure on the surface that would normally be the mesial does not interfere with access to this surface and does not extend on the surface that would normally be the distal beyond the gingival third, while the greater part of the surface that would normally be buccal and lingual is free of ossistructure.

OPERATIVE TECHNIC

Gum Tissue Technic.—In order to determine the location of the bifurcation of the roots, the occlusal surface should be exposed as much as possible. The bifurcation may be anywhere from a slight distance distally to its approximately normal location to a point that would normally be the center of the distal surface. Incision is started at the surface that would normally be the mesial if a torsion did not exist, extending distally along the surface that would normally be the buccal to a point slightly distal to the surface that would normally be the distal. Where the gum tissue extends up to or over the surface that would normally be the mesial, incision is made downward and buccally along the surface that would normally be the mesial.

Ossistructure Technic.—Usually excision is not necessary on any of the surfaces to gain access with the exolever in order to execute the exolever movements.

Exolever Technic—Mesial Application.—Where there is no buccal deflection it will be quite an advantage if the bifurcation can be located. Exolever No. 2L or 3L for the left side or No. 2R or 3R for the right side is selected, depending on the size of the space between the superior border of the ossistructure and the surface that would normally be the mesial surface of the third molar. The flat side of the blade is adjusted to the surface that would normally be the mesial surface of the third molar if there were no torsional deflection, the ossistructure being utilized as a fulcrum, and the tooth is directed distally and upward out of the socket. Where there is a buccal deflection exolever No. 6L or 6R is used to direct the tooth distally.

Buccal Application.—When the tooth has not been extracted by the foregoing procedure and the bifurcation has been located, exolever No. 10L for the left side or No. 10R for the right side is adjusted at the bifurcation, and pressure is exerted downward, the tooth being directed upward. Care should be taken to locate the bifurcation and not permit the instrument to slide about on any of the surfaces. If the bifurcation is located on the surface that would normally be the distal surface of the third molar, the exolever is inserted between the third molar and the ossistructure on this surface, when an adjustment of the instrument is made at the bifurcation and the tooth is directed out of its socket by turning the handle distally.

SUMMARY OF CASES

In the cases shown in Fig. 599 no positive definition of the root formation can be obtained, and not a great deal of resistance should be encountered when the exolever is applied to the surface that would normally be the mesial to direct the tooth distally and upward and no excision of the ossistructure is indicated.

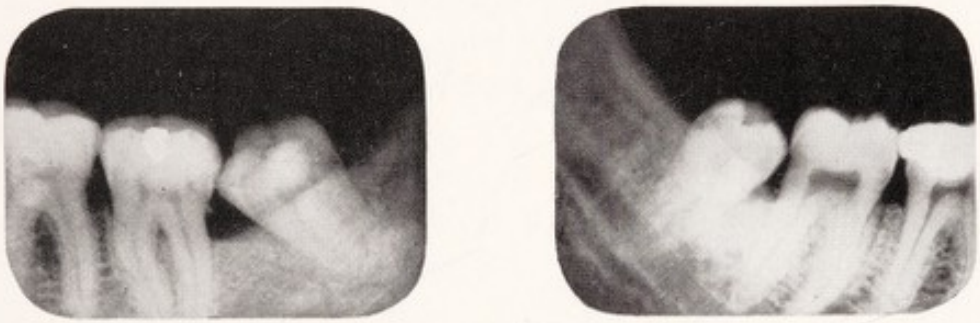


Fig. 599. — Mesioangular Impaction—Torsional Deflection with Surface that Would Normally be Mesial Surface Accessible. No positive definition of root formation can be obtained with surfaces that would normally be mesial, distal, lingual and buccal free of ossistructure down to gingival third.

TORSIONAL DEFLECTION, WITH THE SURFACE THAT WOULD NORMALLY BE THE MESIAL SURFACE INACCESSIBLE

A case where the third molar is in a mesioangular position, with a torsional deflection and where the surface that would normally be the mesial is inaccessible, is more frequently seen than where the tooth is in a similar position and the surface that would normally be the mesial is accessible. In this type of case, as the surface that would normally be the mesial is below the superior border of the ossistructure, with the ossistructure extending on the surface that would normally be the distal surface up to the occlusal surface and on the greater part of the surface that would normally be the buccal, the difficulty of determining the exact location of the bifurcation will usually complicate the extraction.

CLINICAL EXAMINATION

Exposed Crown.—Rarely is any part of the crown exposed.

Gum Tissue.—The gum tissue usually covers the greater part of the crown.

RADIOGRAPHIC INTERPRETATION

Crown.—The occlusal surface of the third molar has an entirely different appearance from a case where the crown is not deflected torsionally. The enamel cap is not, as a rule, definitely outlined and the pulp chamber is usually obliterated. If, however, the pulp chamber is not obliterated, a very small part of it is visible, but usually lacks proper definition. The surface that would normally be the mesial surface of the third molar is, as a rule, in contact with the distal or distobuccal surface of the second. The surfaces that would normally be the buccal and lingual may be in alignment with the buccal and lingual surfaces of the second molar, or there may be a buccal, lingual or buccolingual deflection.

Roots.—As a rule, no positive definition of the root formation can be obtained from the radiogram on account of the torsional deflection of the tooth. The roots will often have the appearance of being fused, and sometimes when the tooth is extracted there will be two normally developed roots.

Ossistructure.—The ossistructure on the surface that would normally be the mesial is inaccessible to the immediate application of the exolever. The ossistructure on the surface that would normally be the distal usually extends beyond the gingival third up to the occlusal surface, and the greater part of the surface that would normally be the buccal is covered by ossistructure.

OPERATIVE TECHNIC

Gum Tissue Technic.—An incision is made downward on the distobuccal surface of the second molar along that part of the tooth that would normally be the mesiobuccal surface if the tooth were displaced buccolingually to gain access to that part of the mesiobuccal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar. A second incision is made distally, following the surface that would normally be the buccal to a point that will permit excision on the surface that would normally be the distal. Where the deflection is not very marked, the latter incision may be made distally and buccally from the distobuccal surface of the second molar. A third incision is made on the distobuccal surface of the second molar. Where the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second, the incision is

made as described where there is no deflection and the mesial surface is inaccessible page 482; where there is a buccal deflection, as described on page 510, and where there is a lingual deflection, as described on page 529.

Ossistructure Technic.—The excision on the surface that would normally be the distal is made as described on page 483, extending down to the gingival third as if there were no torsional deflection. In order to adjust the exolever to the mesial surface the excision is executed as described in a case where there is no deflection and the mesial surface is inaccessible (page 486); in a buccal deflection where the mesial surface is inaccessible (page 512); in a lingual deflection where the mesial surface is inaccessible (page 530), and in a buccolingual deflection where the mesial surface is inaccessible (page 551). Excision on the buccal surface distal to the bifurcation is made, when indicated, as described on page 484. Excision on the occlusal surface is made, when indicated, as described on page 488.

Exolever Technic.—The exolever is adjusted to the surface that would normally be the mesial in a case where there is no deflection and the mesial surface is inaccessible (page 489); and to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar in a buccal deflection with the mesial surface inaccessible (page 515); on the surface that would normally be the mesial surface in a lingual deflection with the mesial surface inaccessible (page 532), or to the surface that would normally be the mesial surface in a buccolingual deflection with the mesial surface inaccessible, as described on page 554. When the tooth is directed as far distally as the excision on the distal surface will permit and has not been extracted by the application of the exolever technic to the mesial surface, exolever No. 10L for the left side or No. 10R for the right side is then adjusted on the buccal surface at the bifurcation if this surface has been determined. If, however, the buccal surface cannot be definitely determined, the exolever is applied to the surface that would normally be the distal, and the blade is sent down on this surface, as the buccal surface is usually in this position. The handle of the exolever is turned distally, which movement will cause the point of the blade to penetrate the bifurcation if it is present, and the ossistructure will make an ideal fulcrum, when the tooth is extracted by this movement. If, when this movement is made, it is observed that the bifurcation is not at this location, the exolever is applied to the surface that would normally be the distobuccal surface and the movement is repeated. The bifurcation is usually in one of these two locations, and, if resistance is encountered, an exolever of a suitable design for adjustment to the mesial surface is reapplied, when the tooth is

directed distally with increased force, after which a buccal application is again made to complete the extraction.

SUMMARY OF CASES

In the cases shown in Fig. 600 a lack of definition of the roots is observed that could have been discerned if the tooth had not been in a torsional deflection. In case there is an extra root or the roots diverge, considerable resistance will be encountered, and the operator may anticipate a fracture of one or both roots. If a fracture occurs, the operator should be prepared to remove any remaining parts. The excision is made and the exolever technic is executed as described above.

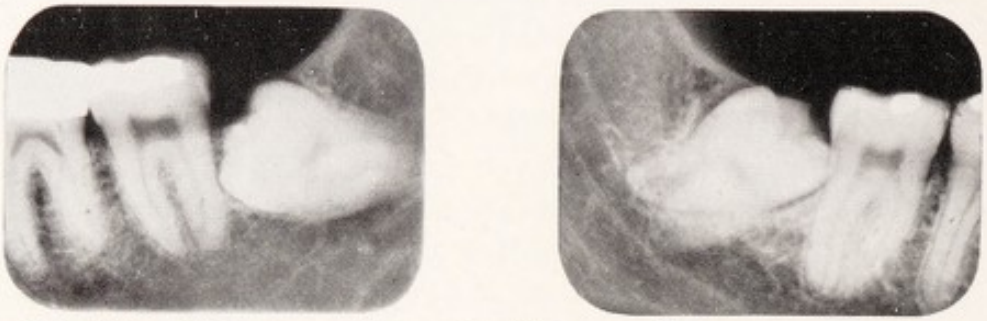


Fig. 600. — Mesioangular Impaction—Torsional Deflection with Surface that Would Normally be Mesial Surface Inaccessible. No positive definition of root formation can be obtained. The ossistructure extends over surfaces that would normally be entire mesial, distal, lingual and buccal and over mesiolingual half of occlusal surface.

ISOLATED POSITION, WITH THE MESIAL SURFACE ACCESSIBLE

The absence of the second molar will allow the operator to take advantage of the broad mesial surface of the tooth or the mesial surface of the mesial root for the application of the exolever, utilizing the ossistructure anterior to or below the mesial surface as a fulcrum. The ossistructure on the distal and buccal surfaces is interpreted in the radiogram to determine in advance the amount of structure to be excised for the application of the exolever and to decrease resistance. A lingual deflection of the tooth, if present, can be determined, but a buccal deflection cannot be determined except by an occlusal radiogram or after the gum tissue has been incised.

CLINICAL EXAMINATION

Exposed Crown.—As a rule, the greater part of the occlusal surface and a part or all of the distal surface is exposed.

Gum Tissue.—The gum tissue on the distal surface usually extends up to the gingival third.

RADIOGRAPHIC INTERPRETATION

Crown.—The extent of the mesial inclination of the tooth is determined, as is also the accessibility of the mesial surface in its relation to the ossistructure below this surface.

In the cases where the enamel cap and pulp chamber are definitely outlined, and no part of the occlusal surface is visible, there is no lingual deflection of the tooth, but in the cases where a part of the occlusal surface is visible, a lingual deflection is indicated.

Roots.—The root formations that may occur in this class of impaction are similar to those seen in other types of mesioangular impaction.

Ossistructure.—The ossistructure on the mesial surface will not, on account of a pathologic involvement, interfere with the application of the exolever. Where the ossistructure is not extensively involved, the condition is favorable for the application of the exolever to the mesial surface, the structure being utilized as a fulcrum. Where, however, the ossistructure is extensively involved, the fulcrum will be placed some distance from the mesial surface, and this will be quite a disadvantage.The distance between the fulcrum and the mesial surface is determined in advance from the radiogram. The ossistructure on the distal and buccal surfaces will not, as a rule, interfere with the exolever movements, and only in an occasional case is excision indicated.

OPERATIVE TECHNIC

Gum Tissue Technic.—Where the entire occlusal and distal surfaces are free of gum tissue, an incision is made at the center of the distal surface and is continued to a slight extent distally. If the gum tissue on the mesial surface will not be subjected to trauma from the exolever, no incision is necessary, but, if the tissue is liable to be injured, an incision is made from the buccal along the mesial surface and is extended lingually far enough to allow the flap anterior to the mesial surface to be displaced.

Where the gum tissue extends over the mesial half of the occlusal surface and no buccal application is indicated, incision is made at the center of the distal surface and extended distally far enough to permit excision on the distal surface. A second incision is then made mesially at the center of the gum tissue over the occlusal surface and far enough to permit the exolever blade to displace the gum tissue over the mesial surface (Fig. 601 A). Where a buccal application is indicated, the second incision is then made mesial to the buccal surface (Fig. 601 B).

Where the gum tissue extends over the greater part of the occlusal surface and on the mesial and distal surfaces, the incision is made so

as to be able to displace the tissue over the entire occlusal surface in order that any gum tissue over the surface will not interfere with the ready access of the exolever to the mesial surface. This incision is started at the distoclusal surface, extending from the lingual to the buccal surface. An incision is then made distally along the center of the distal surface. A second incision is made along the buccal surface far enough to allow the ossistructure on the buccal surface to be excised when indicated, so that, when the tooth is directed distally, the gum tissue will not interfere with the adjustment of the exolever to the buccal surface at the bifurcation (Fig. 601 C).

Ossistructure Technic—Distal Excision.—As the tooth, on account of its original condition or as the result of a pathologic condition is free of ossistructure below the mesial surface down to the gingival

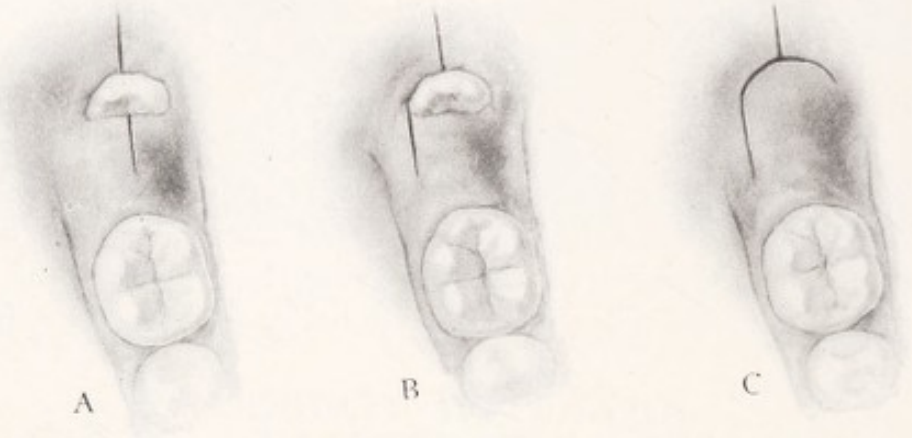


Fig. 601. — Incision of Gum Tissue—Mesioangular Impaction—Isolated Position—Mesial Surface Accessible. *A*, incision distally in line with center of distal surface, mesially in line with center of occlusal surface; *B*, incision distally in line with center of distal surface, mesially in line with buccal surface; *C*, incision distally along center of distal surface, along distoclusal surface, and mesially on buccal surface.

third, no excision is necessary to gain access to apply the exolever to the mesial surface in order to direct the tooth distally and upward out of its socket. The ossistructure on the distal surface, which extends only up to the gingival third, requires no excision; but, if the operator desires to decrease any resistance that may be presented by the roots, excision on the distal surface is executed as described on page 483.

Exolever Technic—Mesial Application.—Where the distal surface of the tooth, on account of its original condition or as the result of excision, is free of ossistructure up to or beyond the gingival third, and access below the mesial surface is readily available, exolever No. 8L for the left side or No. 8R for the right side is selected (Fig. 340, page 291). The ossistructure anterior to or below the mesial surface of the tooth is used as a fulcrum, the gum tissue is displaced with the back of the blade when over the occlusal surface, and the blade is directed under the mesial surface as far distally as the space between the mesial

surface and the ossistructure below this surface will permit, with the back of the blade resting upon the ossistructure anterior to or below the mesial surface. When this adjustment has been made (Fig. 602 A), the handle of the exolever is turned mesially, and this movement will cause the tooth to be directed distally and upward out of its socket (Fig. 602 B). In case the tooth is not extracted by this movement, the exolever is sent farther down into the space created by the first application, and the exolever movement is repeated, provided that the formation of both roots is favorable for such movement. If, however, the formation of the roots is not favorable for such a movement, for instance, when the mesial root is inclined distally and the distal root is straight, the movement is made distally and upward to a distance to

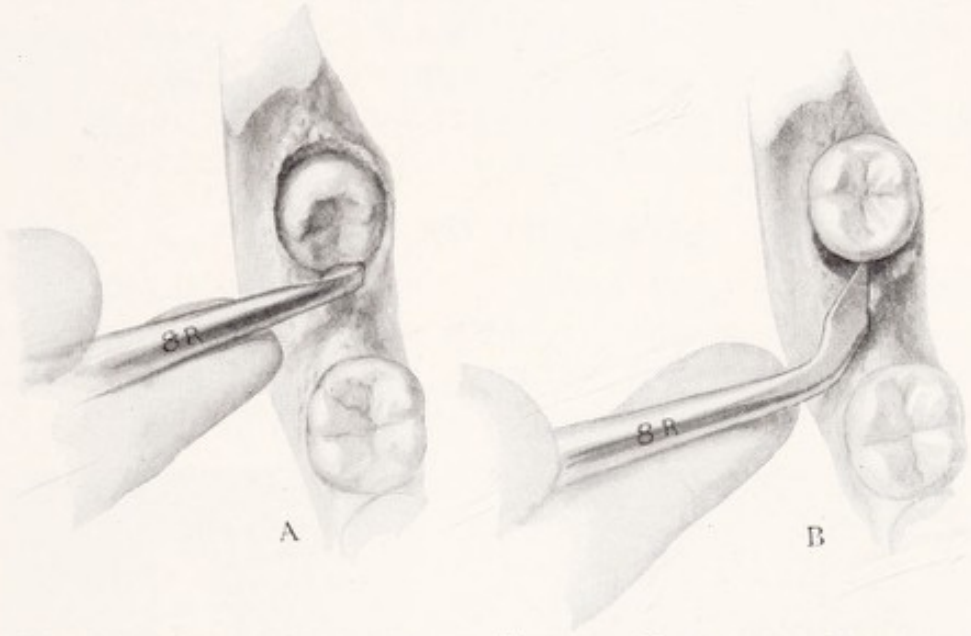


Fig. 602. — Mesial Application of Exolever—Mesioangular Impaction—Isolated Position—Mesial Surface Accessible. *A*, exolever No. 8R applied to center of mesial surface; *B*, tooth directed distally and upward out of its socket by turning handle mesially.

overcome the curvature of the mesial root, and the extraction is then completed by a buccal application. Where the ossistructure anterior to and below the mesial surface is extensively involved by a pathologic condition, the initial application of the exolever to the mesial surface is made with considerable force, but the application is not to be repeated for fear of breaking down further the involved ossistructure. When it is observed that the fulcrum will not withstand the pressure that is being applied, the point of the blade is adjusted for penetrating the ossistructure at the middle third of the mesial root, when a more suitable fulcrum is secured and the exolever movement is made. In a rare case the ossistructure is excised at a point where a firmer fulcrum is desired. Where there is a lingual or buccal deflection, the application of the exolever to the mesial surface is made in conformity with

the deflection, advantage being taken by applying the exolever to the broad mesial surface.

Buccal Application.—After the tooth has been directed out of its socket to a distance where a buccal application can be made, exolever No. 10L for the left side or No. 10R for the right side is applied to the buccal surface at the bifurcation of the roots, with the back of the blade resting on the superior border of the ossistructure, when the handle of the exolever is pressed downward and directed buccally, which movement will extract the tooth, as described for a buccal application (page 472). The operator should, however, be careful to have the point of the exolever blade penetrate the bifurcation. Where both roots are fused or straight and where a pathologic condition has extensively involved the ossistructure on the mesial surface, the application of the exolever is made on the buccal surface at the bifurcation independent of a mesial application. This procedure is followed where the root formation does not require that the tooth be initially directed distally and then no excision is indicated on the distal surface.

SUMMARY OF CASES

In the case shown in Fig. 603 A, where the mesial root is inclined distally and the distal root is inclined mesially with the ossistructure on the distal surface extending up to the gingival third, no excision on this surface is indicated unless the operator anticipates a fracture

A B

Fig. 603. — Mesioangular Impaction—Isolated Position—Mesial Surface Accessible. *A*, mesial root inclined distally and distal root inclined mesially, with ossistructure extending to gingival third; *B*, mesial root straight, with slight mesial inclination of distal root at apical third, with ossistructure extending to gingival third.

of the roots or desires to decrease further any resistance at this point, and no excision on the mesial or buccal surface is indicated. The exolever is adjusted to the mesial surface and the tooth is directed distally to a point where the resistance of the roots and septum between them has been overcome, when the extraction is completed by a buccal application.

In the case shown in Fig. 603 B, where the mesial root is straight and the apex of the distal root is inclined to a slight extent mesially,

a formation that is unfavorable for directing the tooth distally, a buccal application is made and the tooth is extracted by this procedure independent of a mesial application, and no excision of the ossistructure is necessary.

ISOLATED POSITION, WITH THE MESIAL SURFACE INACCESSIBLE

Where the third molar is in a mesioangular position and is isolated, with the mesial surface inaccessible, the distance between this surface and the superior border of the ossistructure is determined so as to ascertain the extent of excision necessary in gaining access with the exolever to the mesial surface.

CLINICAL EXAMINATION

Exposed Crown.—Rarely is any part of the crown exposed, but, if there is any exposure, it is usually a part of the occlusal surface.

Gum Tissue.—The gum tissue covers the greater part of the occlusal surface or the entire crown of the tooth.

RADIOGRAPHIC INTERPRETATION

Crown.—Where the tooth is not deflected lingually, a definite enamel cap and pulp chamber are shown, but no part of the occlusal surface is visible. Any lingual deflection of the tooth should be carefully noted when a part of the occlusal surface is visible, and, as no second molar is present, there will be no method of determining a buccal deflection except by an occlusal radiogram or after the gum tissue has been incised and a clinical examination made.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be similar to those seen in a mesioangular type of impaction.

Ossistructure.—The ossistructure on the distal surface usually extends beyond the gingival third toward the occlusal surface, and may extend up to the latter surface; the ossistructure on the mesial surface extends up to the occlusal surface, and may extend over the latter surface; the ossistructure over the occlusal surface and on the mesial surface will interfere with the application of the exolever to the latter surface, and the ossistructure on the buccal surface extends over the greater part of this surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—The incision is made as described in a case where the tooth is isolated and the mesial surface is accessible (page 571).

Ossistructure Technic—Distal Excision.—The ossistructure on the distal surface is examined to determine to what extent this structure is to be excised. There is a variation in the amount of ossistructure on the distal surface, the structure extending from slightly beyond the gingival third up to the occlusal surface, and excision of the ossistructure on the distal surface is necessary, and in most instances should extend to the gingival third. The excision is executed as described on page 483, and is started at a point on the superior border of the ossistructure nearest the occlusal surface, extending as far as the gingival third. Where the tooth has moved in an anterior course, the condition is favorable for excision on account of the tooth not being located so far distally. When adjusting the ossisector the gum tissue on the distal surface is displaced with the back of the blade, and the blade, with pressure under control, is directed toward the structure to be excised.

Buccal Excision.—Where the tooth can be directed distally and upward to a point where the superior border of the ossistructure will not interfere with a buccal application at the bifurcation, no excision on the buccal surface is indicated; but, where this procedure is not practicable, excision is necessary. The operator determines the extent of the buccal excision by the distance that the tooth is to be directed distally and upward by the application of the exolever to the mesial surface, the excision being governed by the character of the root formation and the extent of distal excision. The excision is made as described on page 484 with ossisector No. 11L for the left side or No. 11R for the right side and is started at the superior border of the ossistructure distal to the bifurcation on the buccal surface, and is extended approximately to a point where the operator is reasonably certain a secure adjustment of the exolever to the buccal surface at the bifurcation can be made.

Occlusal or Mesial Excision.—The distal and buccal excisions having been made, the ossistructure over the occlusal or on the mesial surface is excised for access with the exolever to the mesial surface. The incision that was made will allow the gum tissue to be displaced with the ossisector blade without injury. Where the ossistructure extends over the occlusal surface, the excision is started in line with the center of the occlusal surface (Fig. 604), its course being governed by the interpretation of the radiogram; it is continued toward the ossistructure over the occlusal surface. Ossisector No. 7L for the left side or No. 7R for the right side is selected, and the ossistructure at this point, being of a cancellous nature, is readily excised. When the ossistructure extending over this surface has been excised, the operator should be certain that no part of the structure remains, as any small ledge

will interfere with the exolever movement. The ossistructure below the mesial surface is not excised, as the structure is usually cancellous and should not be weakened by excision, for the blade of the exolever is sharp enough to penetrate the structure in order to obtain a secure adjustment. As the blade of the ossisector, when the ossistructure over the occlusal surface is being excised, strikes the hard enameled surface of the tooth, which is not so smooth as the mesial or distal surface, dulling the blade when it strikes the tooth, it will be necessary to make continual changes of the ossisector to expedite the excision.

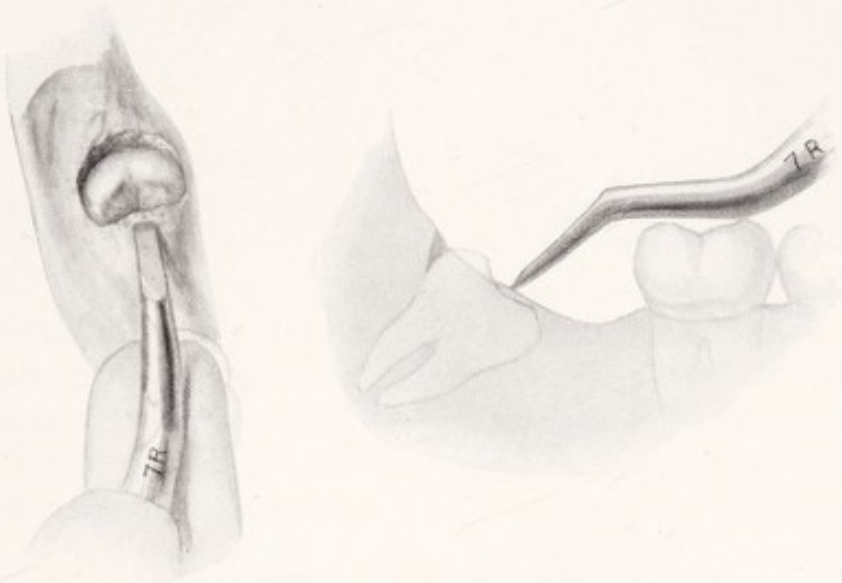


Fig. 604. — Occlusal Excision of Ossistructure for Access to Mesial Surface—Mesioangular Impaction—Isolated Position—Mesial Surface Inaccessible. Ossisector No. 7R applied for excision of ossistructure over occlusal surface.

The degree of mesial angulation of the tooth, when excision along the mesial surface where no excision over the occlusal surface is indicated, should be borne in mind, and only sufficient ossistructure along the mesial surface is excised to allow the exolever to be adjusted to the mesial surface. As the ossistructure along the mesial surface, which is to be utilized as a fulcrum for the exolever, is of a cancellous nature, only sufficient ossistructure is excised to allow the adjustment of the exolever.

Exolever Technic—Mesial and Buccal Applications.—When the excision of the ossistructure has been made, exolever No. 8L or 8R is adjusted to the mesial surface, with the back of the blade resting on the ossistructure anterior to and below the mesial surface (Fig. 602, page 573). The gum tissue is displaced with the back of the blade, and the blade is directed toward the mesial surface with sufficient pressure to create a wedge between the latter surface and the ossistructure on this surface, when a distal movement is made in conformity with the root formation by turning the handle mesially. Occasionally

the tooth will be raised quite a distance out of its socket, and, if it is found that repeated applications will be necessary to extract the tooth, if the root formation will permit such applications, the extraction is completed by this procedure. If, however, the roots are not favorable for the foregoing procedure, exolever No. 10L for the left side or No. 10R for the right side is adjusted to the buccal surface, and the blade is applied with considerable force at the bifurcation, which movement will have a tendency to force the tooth upward. In case the tooth is not extracted by this application, an increased downward pressure, with the back of the blade resting upon the superior border of the ossistructure, is exerted upon the handle of the exolever, with a slight buccal movement to extract the tooth. If, however, the tooth is not extracted by this movement, the procedure is repeated and the blade of the exolever is sent farther down on the tooth until it is extracted. Where the occlusal surface is free of ossistructure and no ledges extend over this surface and the roots are fused, where both roots are straight, and, in such cases where the root formation is such that they are not to be initially directed distally to overcome their resistance or that of the septum between them, in these cases a buccal application can be made independent of a mesial adjustment. Where the ossistructure extends over the entire buccal surface the foregoing procedure is not practicable unless excision is made to permit a buccal application.

SUMMARY OF CASES

In the case shown in Fig. 605 A, where the roots are fused, a slight excision over the mesioclusal surface is made and the exolever is adjusted to the buccal surface at the bifurcation, with pressure under control, and the handle is turned buccally, the tooth being directed out of its socket in alignment with its position. No excision is indicated on the mesial, distal or buccal surface.

In the case shown in Fig. 605 B, where the mesial root is inclined

A B

FIG. 605. — MESIOANGULAR IMPACTION—ISOLATED POSITION—MESIAL SURFACE INACCESSIBLE. *A*, roots fused and ossistructure extends over small part of mesioclusal surface, entire mesial surface and part of distal, lingual and buccal surfaces; *B*, mesial root inclined distally and distal root straight, with ossistructure extending slightly beyond gingival third on distal surface, over mesial half of occlusal surface, on entire mesial and over greater part of lingual and buccal surfaces.

distally and the distal root is straight, excisions are made as follows: an excision on the distal surface beyond the gingival third; a slight excision on the buccal surface distal to the bifurcation, and an excision over the mesial half of the occlusal surface down to the mesial surface to permit the exolever to be adjusted to the latter surface in order to direct the tooth distally and upward far enough to overcome the curvature of the mesial root, when a buccal application is made to complete the extraction.

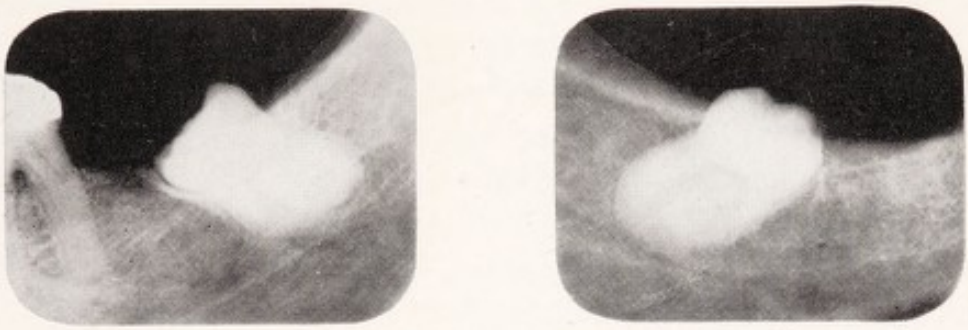


Fig. 606. — Mesioangular Impaction—Isolated Position—Mesial Surface Inaccessible. Roots hypercementosed, with variation in ossistructure on mesial, distal, lingual and buccal surfaces.

In the cases shown in Fig. 606, where the roots are enlarged by hypercementosis, considerable resistance will be encountered. The enlargement of the roots indicates greater excision on the distal surface than would normally be necessary, and, when the exolever is adjusted to the mesial surface, sufficient pressure is applied to direct the tooth distally and upward to loosen it, so that a buccal application can be made to complete the extraction. When excision on the distal surface has been made, the operator need not hesitate to apply the necessary force with the exolever, as the roots are located in cancellous structure, and the increased pressure will not cause a fracture of the roots.

CHAPTER XVIII

Operative Technic in Distoangular Impaction

WHERE it is shown by the clinical examination and radiographic interpretation that the mandibular third molar is impacted in a distoangular position, the technic for extraction, when such a procedure is indicated, should be executed in conformity with the position of the tooth, its root formation, its supporting ossistructure and its relation to the second molar. While the impacted tooth is described as being in a distoangular position, its buccal surface may be in alignment with the corresponding surface of the second molar, or the tooth may be deflected buccally or lingually, and in an occasional case there may be a torsional deflection.

This type of impaction of the mandibular third molar is not so frequently seen in practice as are the vertical, mesioangular and horizontal types, and the extraction of the tooth in this type of impaction is more complicated than in any other type. An operator not familiar with the interpretation of a radiogram may confuse this type with a vertical impaction, and will not observe the ossistructure that is usually found over part of the distoclusal surface, on the distal surface and on the greater part of or the entire buccal surface.

The conditions that may complicate the operative technic in this character of impaction are the perplexity of gaining access for the application of the exolever, the indication of excessive excision of the ossistructure over the distoclusal surface and on the buccal and distal surfaces, the overcoming of the resistance of the septum between the roots, when present, and the difficulty of executing the exolever movements.

It was a common practice for many years to use what are known as physic forceps in the extraction of an impacted mandibular third molar. When these forceps were used in this type of impaction where the ossistructure extended over the distoclusal surface, and the instrument was applied with a great deal of force in an attempt to extract the third molar, a fracture of the mandible invariably followed. If in such a case the beaks of the physic forceps are closed upon the third molar and the second molar is used as a fulcrum, with the object of directing the third molar distally, it will be found that the ossistructure that is usually over the occlusal surface and on the distal surface will not allow such a movement, and, if considerable force is applied, the mandible will be fractured.

A fracture similar to that described above will occur if the blade of an exolever is inserted with considerable force between the second and third molars without making the necessary preliminary excision of the ossistructure over the occlusal or on the distal surface. The operative technic, as in a vertical or mesioangular impaction, is designed to eliminate the forceps and obviate the excision of any part of the crown with a bur or stone, making the necessary excision of the ossistructure with an ossisector, after which the exolever is properly applied.

In the majority of cases of this type of impaction the mesial or mesiobuccal surface is accessible to the immediate application of the exolever. The space between the second and third molars will vary from being very small to being quite large, with a correspondingly large interseptum between these two teeth. The farther the crown is inclined distally, the more complicated will be the access for the excision and the application of the exolever. The excision is confined to the area intended for the application of the exolever and is made so as to permit the exolever movements. Precaution should be taken to prevent the ossisector from coming in contact with the external or internal oblique ridge or any part where excision is not necessary to decrease resistance.

The mesial surface of the mesial root of the third molar is often in close contact with the distal surface of the distal root of the second, and, if the exolever movements are not properly executed, there is a liability of dislodging the second molar.

In case the radiogram has been incorrectly made, it will show greatly exaggerated conditions, and the operator should not attempt the operative procedure from an incorrectly made radiogram, as unnecessary trauma will follow where a correct definition has not been obtained, and there is a liability of fracturing the crown or roots.

For the purpose of describing systematically the technic in the various types of distoangular impaction of the mandibular third molar, the following classification is used:

1. No deflection, with the mesial surface accessible
2. No deflection, with the mesial surface inaccessible
3. Buccal deflection, with the mesial surface accessible
4. Buccal deflection, with the mesial surface inaccessible
5. Lingual deflection, with the mesial surface accessible
6. Lingual deflection, with the mesial surface inaccessible
7. Torsional deflection, with the surface that would normally be the mesial surface accessible
8. Torsional deflection, with the surface that would normally be the mesial surface inaccessible

9. Isolated position, with the mesial surface accessible
10. Isolated position, with the mesial surface inaccessible

NO DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

Cases where the third molar is in a distoangular position, with the buccal surface in alignment with the corresponding surface of the second molar and the mesial surface is accessible to the immediate application of the exolever, are the prevailing types of distoangular impaction.

CLINICAL EXAMINATION

Exposed Crown.—As a rule, no part of the crown is exposed, but, should there be any exposure, it will be the mesioclusal surface.

Gum Tissue.—The description above in regard to the exposed crown will apply to the condition of the gum tissue.

RADIOGRAPHIC INTERPRETATION

Crown.—An examination is made of the angulation of the occlusal surface. The crown shows a definite enamel cap and pulp chamber, and no part of the occlusal surface is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surface of these two teeth is visible. In the majority of cases there is very little space between the second and third molars, and in other cases there will be the opposite condition of a very large space between these two teeth. Where the third molar is markedly inclined distally, with the mesial surface of the mesial root impinging upon the distal surface of the distal root of the second molar, the pressure of the root of the third molar usually has a tendency to deflect the contact point between the first and second molars, and in the majority of cases there is an involvement of the interseptum between the latter teeth. These conditions, if present, are studied to determine the probable condition of the second molar and its value to the patient after the extraction of the impacted tooth.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root straight, 20; fused roots, 5; both roots inclined distally, 3; partially developed roots, 2, and mesial root inclined distally and distal root inclined mesially, 2.

Ossistructure.—The mesial surface is free of ossistructure from the occlusal surface down to the gingival third. The ossistructure on the distal surface is usually involved by a pathologic condition, and

in an extremely rare case this surface is free of ossistructure, due to the pathologic involvement, down to the gingival third, with sufficient space on the distal surface to permit the tooth to be directed distally without excision. Where the ossistructure is involved only slightly by a pathologic condition, the structure will remain an interfering factor, and no great dependence can be placed on the involved area to decrease resistance. Occasionally the ossistructure extends only up to the occlusal surface, but in the majority of cases it extends over the latter surface. It is unusual to find the buccal surface entirely free of ossistructure, and, in order to determine the extent of ossistructure that may be on this surface, the operator should follow the superior border of the ossistructure, starting in the region of the first or second molar, and drawing an imaginary line distally to the ossistructure on the distal surface of the third molar. In the greater number of these cases only a small part of the buccal surface in the region of the mesiobuccal surface will be found free of ossistructure.

OPERATIVE TECHNIC

Gum Tissue Technic.—When incising the gum tissue, the clinical examination and radiographic interpretation will govern the incision to be made to gain access. If the gum tissue in the region of the mesial surface will not interfere with access to this surface and will

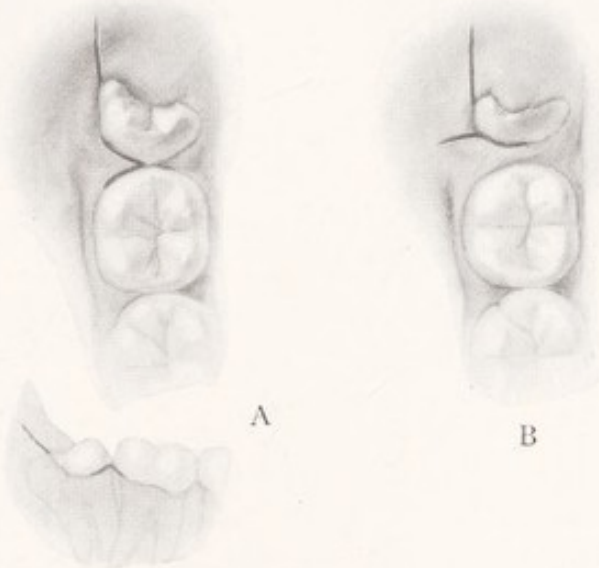


Fig. 607. — Gum Tissue Incision—Distoangular Impaction—No Deflection—Mesial Surface Accessible. *A*, incision distally along buccoclusal surface, on mesiobuccal surface of third and distobuccal surface of second; *B*, incision distally along buccoclusal surface, downward and buccally at mesial surface and along mesial surface.

not be subject to injury by the application of the ossisector or exolever, an incision is made distally along the buccoclusal surface, starting at the exposed part of the third molar, to a point that will permit excision of the ossistructure on the distal surface and allow the appli-

cation of the exolever to the buccal surface. In addition to the distal incision, incision is also made on the mesiobuccal surface of the third molar and on the distobuccal surface of the second if there is a liability of the tissues on these surfaces being injured (Fig. 607 A). If, however, it is found necessary to incise the gum tissue along the mesial surface, an incision is made on the buccal surface downward in alignment with the mesial surface of the third molar. This incision is followed by a second one, which is started at the mesial surface and is extended distally along the buccoclusal surface to a point that will permit excision of the ossistructure on the distal surface and allow

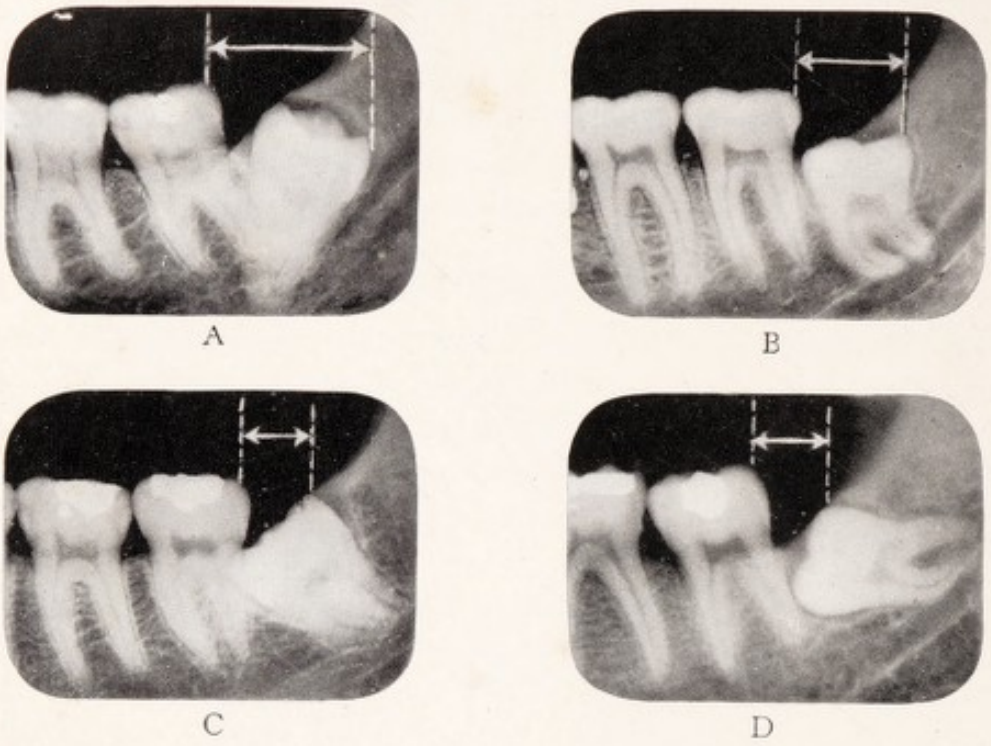


Fig. 608. — Comparison of Ossistructure on Distal Surface—Distoangular Impaction. *A*, ossistructure on distal surface of a distoangular impaction, which should be compared with the three other types of impaction as to distance for access, which is greater in this type of a case than in the other three of the four main types of impaction; *B*, ossistructure on distal surface of a vertical impaction; *C*, ossistructure on distal surface of a mesioangular impaction; *D*, ossistructure on distal surface of a horizontal impaction.

the application of the exolever to the buccal surface at the bifurcation (Fig. 607 B). Where the ossistructure extends over the greater part of the occlusal surface of the third molar and the gum tissue over this surface and on the distal surface of the second molar is very thick, an incision is made on the buccal half of the distal surface of the second molar. This incision will avoid injury to the gum tissue in this region when the ossisector and exolever are applied.

Ossistructure Technic—Distal Excision.—In only a few cases it will be unnecessary to excise the ossistructure on at least some part of the tooth, as in almost every case excision is made on the distal surface to permit the tooth to be directed distally and upward and

also on the buccal surface to allow the application of the exolever to this surface. Ossisector No. 1L or 3L for the left side or No. 1R or 3R for the right side is selected. Access for excision in this class of impaction is not so favorable as in the vertical or mesioangular type. The distance of the distal surface from the corresponding surface of the second molar, when compared with the distance in a vertical, mesioangular or horizontal impaction, is often very marked, as illustrated in Fig. 608, and demands an increase in the length of the shank of the ossisector to improve access to the distal surface which has been added to ossisector No. 3L or 3R, which instrument is indicated where the distance for access is greater than in the other types of impaction.

In the case where the ossistructure on the distal surface is involved by pathologic changes, but is not involved to an extent to permit the tooth to be directed distally and upward to overcome the resisting septum between the roots, excision is made on the distal surface down to the gingival third.

In the case where the ossistructure on the distal surface is not involved by a pathologic condition, the structure will extend up to the occlusal surface. The gum tissue, which usually covers the greater part of the occlusal surface, is displaced with the back of the blade, and the blade is directed toward the distal surface, when excision is made along this surface (Fig. 609 B, page 586). The difficulty of access in this region will make it necessary to proceed with caution in order that unnecessary excision is not made. With each reapplication of the ossisector, which procedure is usually necessary, the blade is sent farther distally and excision is made down to the gingival third. The excision is practically the same as described for a vertical impaction where there is no deflection and the mesial surface is accessible (Fig. 372, page 347).

Occlusal Excision.—Cases where the ossistructure extends over the occlusal surface are very common. On rare occasions the internal and external oblique ridges will cast shadows which will have the appearance of ossistructure over the occlusal surface, and if the operator in a case of this kind finds no ossistructure over the occlusal surface, the condition will be to his advantage.

Where the ossistructure is over the occlusal surface, ossisector No. 3L, 3R; No. 5L, 5R; or No. 11L, 11R is selected. The gum tissue over the occlusal surface is displaced with the back of the blade, and the blade is directed toward the ossistructure over this surface. Several ossisectors of the same design should be available in order that a change of these instruments can be made as conditions may require. When the blade is directed toward the occlusal surface, it will strike the hard enamel surface of the tooth, which will have a tendency to dull the

instrument, and a dull blade will not excise properly, but only prolong the procedure. The excision over the occlusal surface is continued until the entire surface is free of ossistructure, and the operator should not confine the excision to the center of the occlusal surface, but should excise toward the distolingual and distobuccal surfaces in order to be certain that no ledge will remain over the occlusal surface.

In Fig. 609 A is shown ossisector No. 5R applied to the ossistructure over the distal half of the occlusal surface. When the instrument

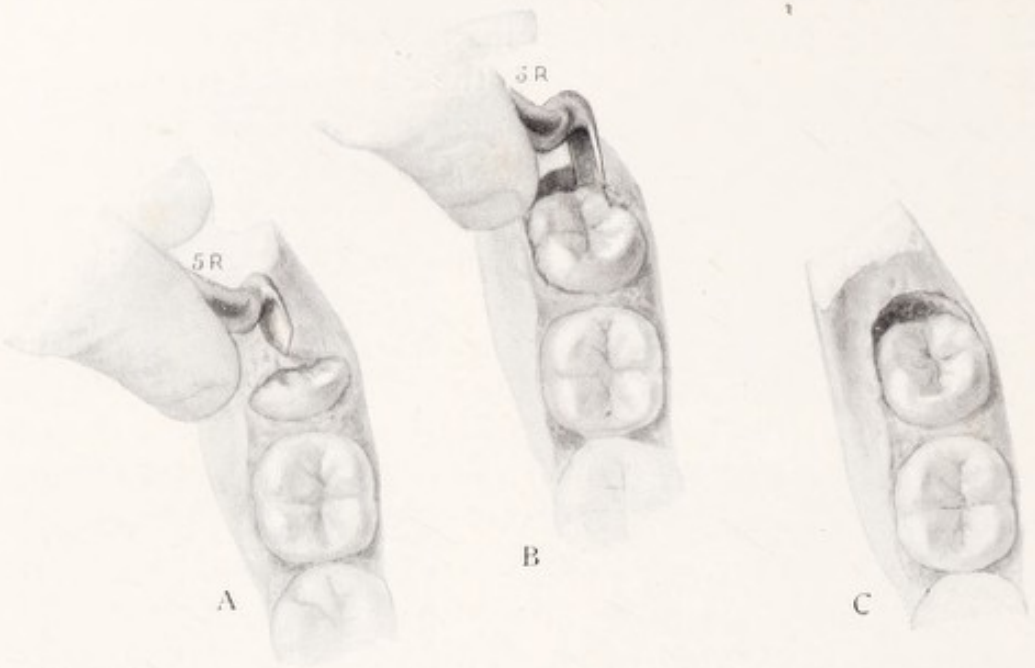


Fig. 609. — Occlusal and Distal Excisions of Ossistructure—Distoangular Impaction—No Deflection. *A*, ossisector No. 5R applied to ossistructure over occlusal surface; *B*, ossisector No. 3R continuing excision on distal surface; *C*, excision made over occlusal and on distal surface.

has been adjusted it is turned to the right and left, and a gouging movement is made in order to penetrate through the ossistructure. The instrument may be used for the entire excision where the structure is dense or the excision may be completed with ossisector No. 3R, as shown in Fig. 609 B. In Fig. 609 C is shown the excision made over the occlusal and distal surfaces.

Where the ossistructure extends over the greater part of the occlusal surface and the roots are partially developed, or, in that type of a case where the structure is involved by a pathologic condition, the entire excision can be made with ossisector No. 11L or No. 11R by directing the blade first toward the buccal half and then between the superior border and the occlusal surface on the lingual half, as illustrated where the tooth is deflected lingually and the ossistructure extends over the lingual fourth or half of the crown (Fig. 635, page 609).

Buccal Excision.—In the majority of cases excision of the ossi-

structure on the buccal surface is indicated, and rarely is a case presented where such excision should not be made. The alignment of the superior border of the ossistructure is determined from the radiogram and compared with the root formation.

As in most cases the bifurcation of the roots is located quite a distance below the superior border of the ossistructure, it is necessary, in order to secure a dependable adjustment of the exolever on the buccal surface at the bifurcation, to excise sufficiently

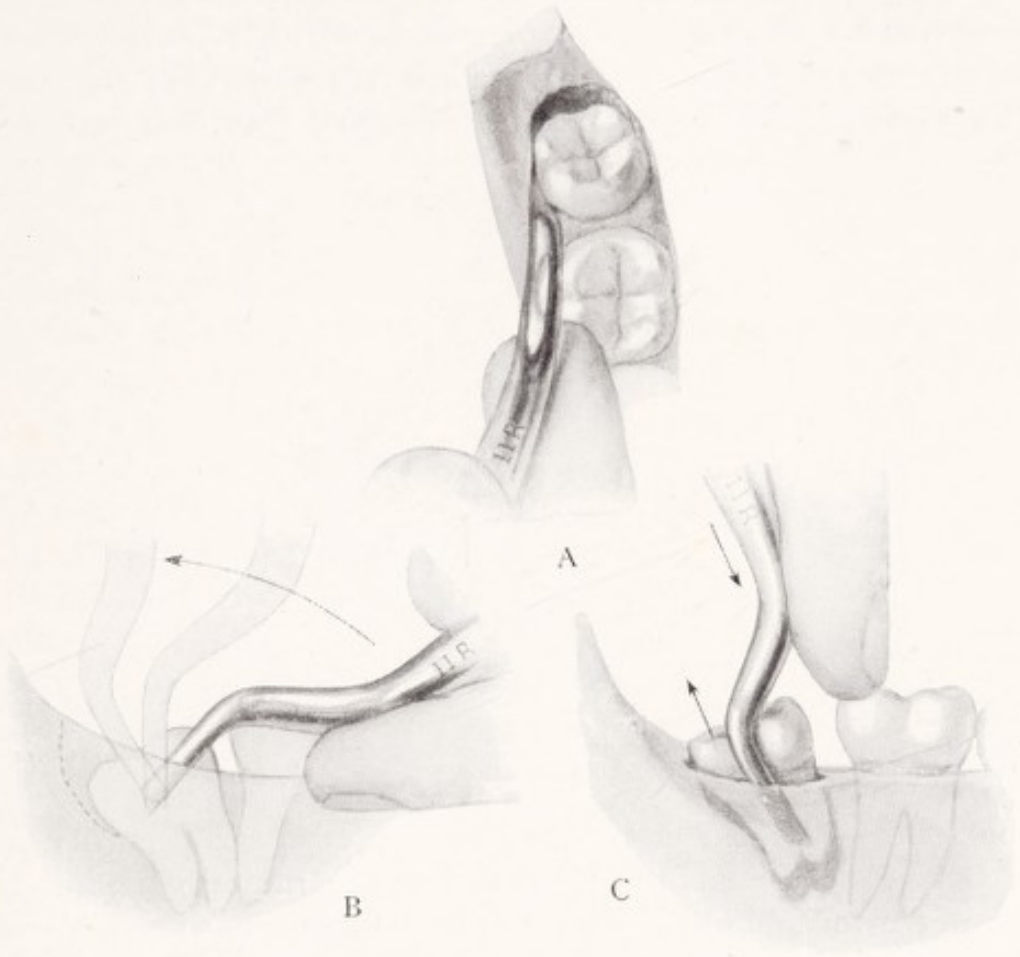


Fig. 610. — Buccal Excision of Ossistructure—Distoangular Impaction—No Deflection—Mesial Surface Accessible. A, ossisector No. 11R, viewed from occlusal, applied to buccal surface; *B*, ossisector No. 11R applied between buccal surface and space between latter surface and ossistructure; *C*, blade wedged between buccal surface and ossistructure and tooth directed upward.

on this surface to allow an application of the exolever and permit the exolever movements to extract the tooth. Ossisector No. 11L for the left side or No. 11R for the right side is selected, and the gum tissue on the buccal surface is displaced with the back of the blade. The ossisector is adjusted to the part of the buccal surface that is free of ossistructure, which surface is used as a guide, and the blade is directed between the ossistructure and the buccal surface (Fig. 610 A), the ossistructure being excised on the buccal surface between the tooth and the ossistructure on this surface.

The ossistructure on the buccal surface is usually not very dense, or there may be a space between the buccal surface and the ossistructure on this surface, and frequently the blade can be wedged quite a distance into this space (Fig. 610 B). If the blade of the ossisector can be wedged in this manner, the operator should determine whether the space is large enough to allow the exolever to be adjusted without excision. If the space will not allow the application of the exolever, the blade is withdrawn and brought up to the superior border of the ossistructure, and, if this structure is weakened by a pathologic involvement, which is usually the case, excision is readily made to enlarge the space so that the exolever can be adjusted. If, however, it is observed that this technic can-

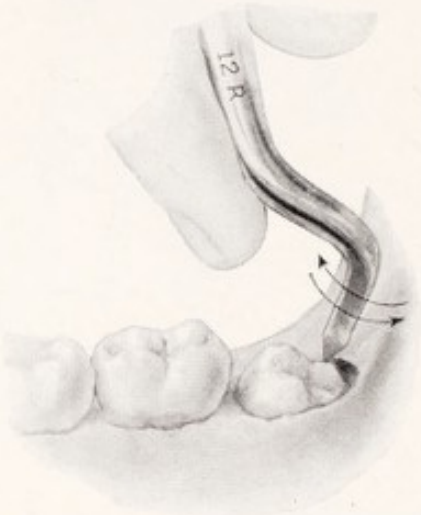


Fig. 611. — Buccal Excision of Oss'structure—Distoangular Impaction—No Deflection—Mesial Surface Accessible. Ossisector No. 12R applied for excision on buccal surface distal to bifurcation.

not be followed, excision is started on the superior border of the ossistructure at the point indicated by the radiogram, and is extended downward, slightly distal to the bifurcation, to a point where, after the tooth has been directed distally and upward by the application of the exolever to the mesiobuccal surface, the exolever can be applied to the buccal surface at the bifurcation to complete the extraction.

Where there is no large septum between the roots to be fractured, and the tooth is not to be directed distally by the application of the exolever to the mesiobuccal surface, the blade of the ossisector above mentioned can often be wedged between the buccal surface and the ossistructure in the location of the bifurcation, and the tooth directed upward out of its socket (Fig. 610 C).

Where there is a marked distoangular deflection and the external oblique ridge extends along the greater part of the buccal surface, the structure is then so dense that it will not permit the excision

to be made with ossisector No. 11L or 11R, and ossisector No. 12L or 12R is then indicated to penetrate initially through the ridge. The gum tissue on the buccal surface is displaced with the back of the blade and the point is directed at or distal to the bifurcation, depending on the indicated exolever technic, and, when adjusted (Fig. 611) the handle is turned mesially and distally, with pressure under control, until a sufficient opening has been made to permit further excision with ossisector No. 11L or 11R. The former instrument possesses sufficient strength when applied to serve as an exolever, and the pressure applied when excising or wedging the blade between the ossistructure and the tooth is often sufficient to loosen the tooth. If it is observed after the excision has been made that the extraction can be completed with the ossisector, the operator should not stop to change for an exolever indicated for a buccal application.

Exolever Technic—Mesiobuccal Application.—In the execution of the exolever technic the operator should not immediately attempt to make the application of the instrument with great force, or place too much dependence on the exolever, with the expectation that the tooth can be extracted without excision of the ossistructure. Successful results in operative technic depend principally on the proper excision of the ossistructure at those points where resistance may be indicated, so that the tooth may be more readily extracted with the exolever.

In a great many cases of vertical impaction the exolever can be applied with less excision of the ossistructure than in this type of impaction. The initial application of a large exolever blade between the second and third molars should be avoided, and the ossistructure along the mesiobuccal surface is to be used as a fulcrum.

Where there is quite a space between the second and third molars and in those cases where the mesial root of the third molar is in close contact with the distal root of the second, or where the clinical examination or occlusal radiogram shows that the width of the mesial surface of the third molar is greater than the width of the distal surface of the second, exolever No. 9L for the left side or No. 9R for the right side is indicated, thus obviating the use of the second molar as a fulcrum. The gum tissue over the mesiobuccal surface is displaced, as illustrated for a vertical impaction (Fig. 387, page 370), and, as the blade is shaped so as to fit along the mesiobuccal surface, the instrument is applied at this point (Fig. 612) and directed downward, and the wedge thus formed will often have a tendency to extract the tooth. Where resistance is encountered and the tooth has not been extracted, the handle of the exolever is

forced mesially or distally to direct the tooth to a slight extent upward and distally, which movement will have a tendency to break up the attachment of the roots to the supporting ossistructure and fracture the septum between them.

If the exolever movements have not loosened the tooth or raised it out of its socket to a point where a buccal application of the exolever can be made, the operator should not attempt to hasten the ex-

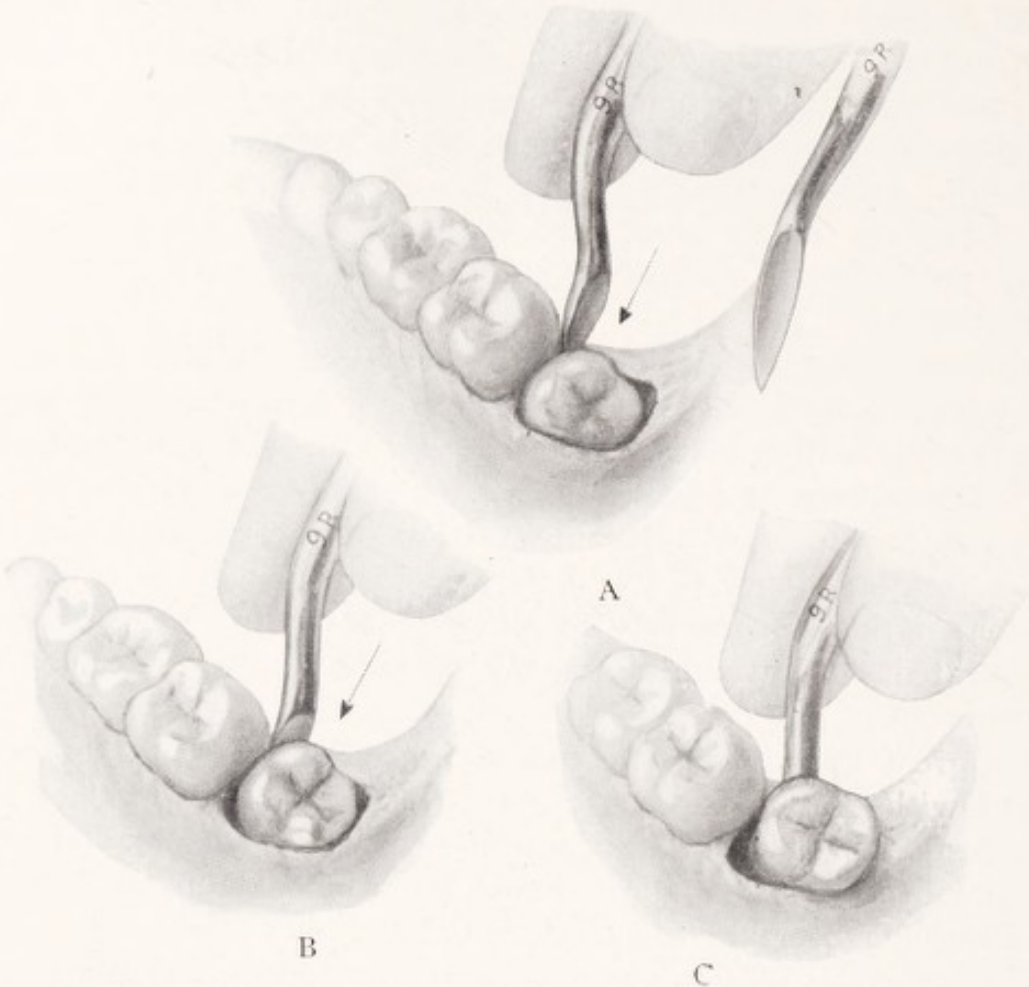


Fig. 612. — Mesiobuccal Application of Exolever—Distoangular Impaction—No Deflection—Mesial Surface Accessible. *A*, exolever No. 9R applied to mesiobuccal surface; *A*, Exolever 9R showing shape of blade; *B*, blade directed downward and wedged between mesiobuccal surface and ossistructure on this surface; *C*, tooth directed distally and upward out of socket.

traction by applying an exolever with a larger blade between the second and third molars to force the tooth distally, as a fracture of the crown or roots will follow if this procedure is undertaken. The exolever is therefore withdrawn from its adjustment to the mesiobuccal surface, and, if it is found necessary, the ossistructure on the distal surface is excised farther. The exolever is again applied to the mesiobuccal surface to direct the tooth upward and distally, and this procedure is repeated, if necessary, until the tooth is directed out of its socket to a point where a buccal application of the exolever can be made.

When the operator becomes accustomed to the technic described, he will at the outset excise sufficient ossistructure on the distal surface to obviate repeated applications of the exolever and ossisector. An operator not familiar with this technic will fail to excise the ossistructure on the distal surface sufficiently to permit the tooth to be directed upward and distally. When the tooth has been loosened and partially raised out of its socket to a point where the superior border of the ossistructure will not interfere with the application of the exolever to the buccal surface, such application is made and the indicated exolever movements are executed to extract the tooth.

Fig. 613. — Buccal Application of Exolever—Distoangular Impaction—No Deflection—Mesial Surface Accessible. Point of exolever No. 10R applied to buccal surface in line with bifurcation in order to direct blade downward between buccal surface and ossistructure.

Buccal Application.—On account of the distoangular position of the tooth, all interfering ossistructure over the occlusal surface should be excised in advance of the application of the exolever to the buccal surface at the bifurcation to complete the extraction, as the exolever movements cannot be made if any ledge remains. Exolever No. 10L for the left side or No. 10R for the right side is selected. The gum tissue on the buccal surface is displaced with the back of the blade, and the blade is applied between the buccal surface and the ossistructure on this surface (Fig. 613). Pressure is applied downward on the handle and the wedge created usually raises the tooth partially out of its socket, when the handle of the exolever is again pressed downward and turned buccally, the exolever movement being repeated until the tooth is extracted. The space available for the application of the blade, the ossistructure to be used as a fulcrum, and the distance that the bifurcation is located from the

superior border of the ossistructure will govern the exolever technic.

Where the operator is skilled in the use of the exolever for a buccal application, in a great many cases after the ossistructure has been excised from over the occlusal surface and the septum between the roots is not large, the mesiobuccal application can be eliminated, and the entire operation can be completed by a buccal application. This procedure, however, should not be attempted if the ossistructure on the buccal surface will not permit the adjustment of the exolever, but it can be done after the ossistructure on the buccal surface has been excised to a point that will permit the application of the exolever to this surface at the bifurcation, the ossistructure on the buccal surface being utilized as a fulcrum.

The foregoing procedure obviates excision of the ossistructure on the distal surface and the application of the exolever to the mesiobuccal surface.

SUMMARY OF CASES

In the cases shown in Fig. 614 the mesial root is inclined distally and the distal root is straight, with a contact of the roots and with extensive pathologic involvement of the ossistructure on the distal surface. Excision is indicated on the distolingual surface to decrease resistance because often a ledge is present, as is shown in the radiogram. Although the buccal surface is free of ossistructure down to the gingival third, a slight excision is indicated distal to the bifurcation in order to secure a suitable fulcrum. The exolever is adjusted to the mesiobuccal surface and the tooth is directed upward and distally far enough to overcome the distal curvature of the mesial root and to loosen the tooth, when the extraction is completed by a buccal application.

In the cases shown in Fig. 615 the same technic is executed as in the cases shown in Fig. 614, except that greater excision is necessary. The ossistructure on the distal surface is not so extensively involved by a pathologic condition, and excision on this sur-

Fig. 614. — Distoangular Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight. The ossistructure on distal surface, which is involved by a pathologic condition, extends to gingival third. There is a ledge of ossistructure on distolingual surface, and structure on lingual and buccal surfaces is varied.

face is indicated, but no excision on the buccal surface is necessary. Where the mesial root of the third molar is in close contact with the distal root of the second, the exolever is applied, with pressure under control, to the mesiobuccal surface, care being taken not to direct the tooth so far distally as to dislodge the second molar. Dependence is placed on a buccal application to complete the extraction after the tooth has been loosened.

Fig. 615. — Distoangular Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight. The ossistructure on distal surface, which is slightly involved by a pathologic condition, extends up to occlusal surface and over part of lingual and buccal surfaces.

In the cases shown in Fig. 616, where the mesial root is inclined distally and the distal root is straight, the technic is the same as in the cases shown in Figs. 614 and 615, except that, in addition to the excision on the distal surface, excision over the distoclusal surface is indicated. No excision on the buccal surface is necessary.

Fig. 616. — Distoangular Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight. The ossistructure on distal surface, which is slightly involved by a pathologic condition, extends over distoclusal surface and part of lingual and buccal surfaces.

In the case shown in Fig. 617 A, where the mesial root is inclined distally and the distal root is inclined mesially, with a septum between them, and the mesial root is in close proximity to the distal root of the second molar, excision of the ossistructure on the distal surface is indicated. When the exolever is adjusted to the mesiobuccal surface to direct the tooth upward and distally, sufficient pressure, under control, is applied to fracture the septum between the roots, care being taken to avoid injury to the second molar. A buccal application to complete the extraction should not be attempted until the tooth has been loosened and the septum between

the roots has been fractured by the application of the exolever to the mesiobuccal surface, as no dependence can be placed on the buccal application to fracture the septum.

In the case shown in Fig. 617 B, where the roots are fused, the ossistructure extends over the distoclusal surface and is excised in advance of the ossistructure on the distal surface. The exolever is applied to the mesiobuccal surface to direct the tooth distally, and the extraction is completed by a buccal application.

A B

Fig. 617. — Distoangular Impaction—No Deflection—Mesial Surface Accessible. *A*, mesial root inclined distally and distal root inclined mesially. The ossistructure on distal surface is involved by a pathologic condition, and part of lingual and buccal surfaces is free of ossistructure; *B*, roots fused, with ossistructure extending over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

In the cases shown in Fig. 618, where the mesial root is inclined distally and the distal root is straight, the application of the exolever to the mesiobuccal surface of the third molar, on account of the close relation of this surface to the distal surface of the second molar, should be made with caution in order not to loosen the second molar. The operator should be certain that all ossistructure over the distoclusal surface and on the distal surface has been sufficiently excised to permit the tooth to be extracted without much resistance, as the interseptum between the first and second molars is usually involved in these cases. No excision on the buccal surface is indicated to allow the adjustment of the exolever.

In the cases shown in Fig. 619, where the mesial root is inclined distally and the distal root is straight, the mesial root of the third

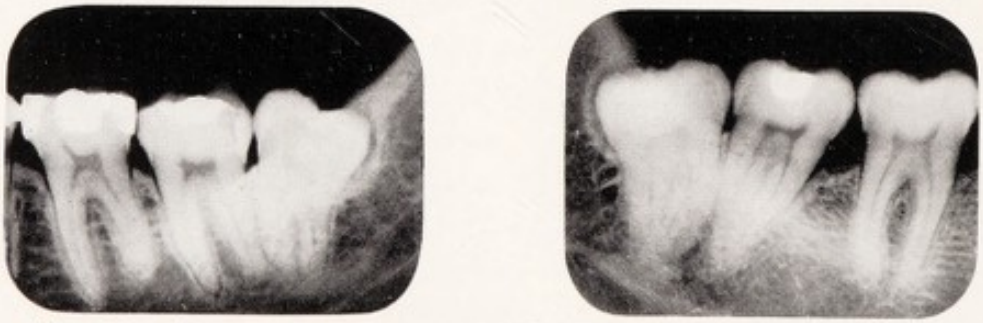


Fig. 618. — Distoangular Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with ossistructure extending over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

molar is in contact with the distal root of the second. The ossistructure extends over the distoclusal surface and on the greater part of the buccal surface, excision being indicated over the occlusal surface and on the distal and buccal surfaces. When the exolever is applied to the mesiobuccal surface to direct the tooth distally to overcome the curvature of the mesial root, the extraction movements should be carefully executed, as there is a liability of injuring the second molar. The extraction is completed by a buccal application.

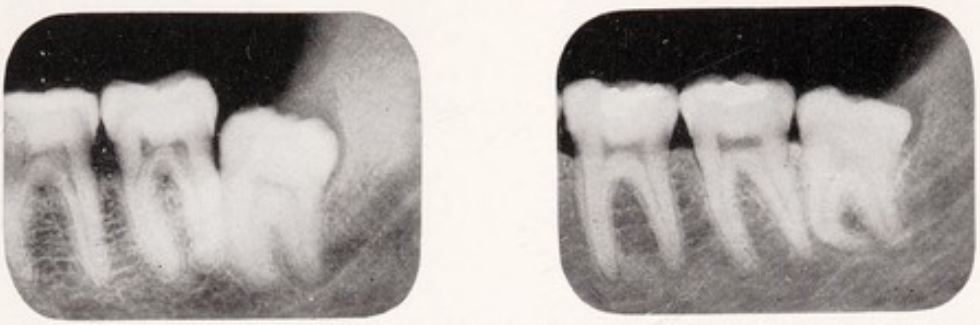


Fig. 619. — Distoangular Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with ossistructure extending over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

In the case shown in Fig. 620 A the technic is the same as in the case shown in Fig. 619, except that more pressure downward is applied to the mesiobuccal surface to create a wedge, and this will overcome the resistance of the septum between the roots. The extraction is then completed by a buccal application. In the case shown in Fig. 620 B the roots are fused, with an extensive pathologic condition of the ossistructure over the occlusal surface, which conditions will decrease the difficulty of excision over this surface. After the ossistructure over the occlusal surface has been excised an excision is made on the buccal surface to gain access with the exolever, and the technic for a buccal application is then executed, as the fused roots will obviate the necessity of a mesiobuccal application, and the entire extraction is completed by a buccal application.

A B

Fig. 620. — Distoangular Impaction—No Deflection—Mesial Surface Accessible. *A*, mesial root inclined distally and distal root inclined mesially, with ossistructure extending over greater part of occlusal surface, entire distal surface and greater part of lingual and buccal surfaces; *B*, roots of third molar fused, with an extensive pathologic condition of ossistructure over occlusal surface, the structure extending over entire distal and greater part of lingual and buccal surfaces. Contact of roots in both cases.

In the cases shown in Fig. 621 the ossistructure extends over the entire occlusal surface, and is excised in advance of the structure on the distal surface. Excision on the buccal surface is also indicated to permit a buccal application. Exolever No. 9L for the left side or No. 9R for the right side is applied to the mesiobuccal surface for the purpose of directing the tooth slightly upward and distally to a point that will allow a buccal application. The contact of the roots should be

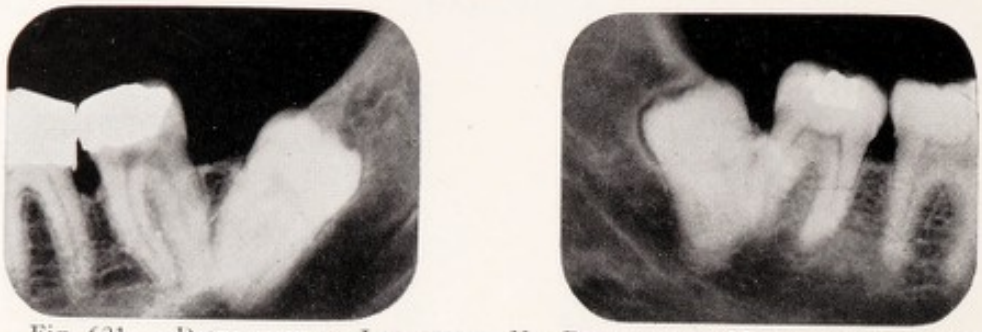


Fig. 621. — Distoangular Impaction—No Deflection—Mesial Surface Accessible. Roots fused and in contact with distal root of second molar. The ossistructure extends over entire occlusal, distal, lingual and buccal surfaces.

kept in mind when directing the crown upward and distally by the application of the exolever to the mesiobuccal surface of the third molar, so as not to loosen the second molar. Where a part or the entire mesial surface of the mesial root of the third molar is in contact with the distal root of the second, a radiogram should be made after the extraction to determine the condition of the distal root of the second molar, as the radiogram taken before the operation will not always positively detail the exact condition.

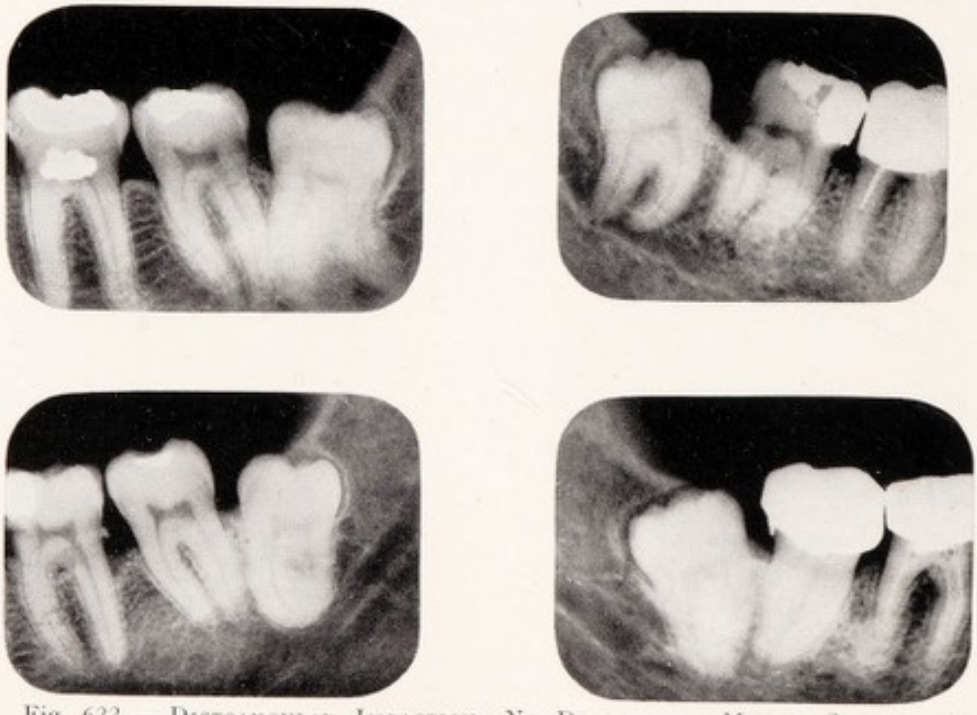
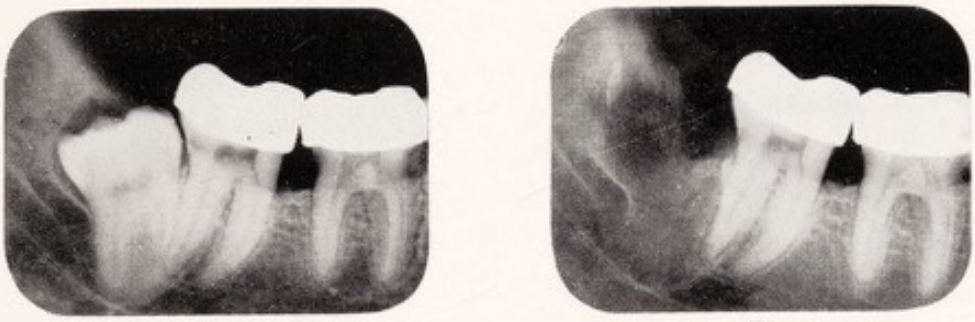


Fig. 622. — Distoangular Impaction—No Deflection—Mesial Surface Accessible. There is a variation in root formation, with ossistructure extending over distoclusal surface, entire distal surface and greater part of buccal and lingual surfaces. There is a large interproximal space between second and third molars.

In the cases shown in Fig. 622 there is quite a large interproximal space between the second and third molars, and a mesiobuccal application of the exolever independent of the use of the second molar as a fulcrum is indicated. No excision on the mesial surface is necessary, but excision over the occlusal surface and on the distal and buccal surfaces is indicated. After the exolever indicated in this type of a case is applied to the mesiobuccal surface, the extraction is completed by a buccal application.

Fig. 623. — Distoangular Impaction—No Deflection—Mesial Surface Accessible. Same case before and after extraction, where contact of root of third molar has caused an upward deflection of second molar.



A B

Fig. 624. — Distoangular Impaction—No Deflection—Mesial Surface Accessible. Same case. *A*, there is a marked contact of roots with a crown attached to second molar; *B*, case after extraction.

A B

Fig. 625. — Distoangular Impaction—No Deflection—Mesial Surface Accessible. Same case. *A*, entire crown and greater part of mesial root is in contact with second molar; *B*, case after extraction.

In Fig. 623 is shown a radiogram of a case before and after extraction where the pressure produced by the contact of the root of the third molar has deflected the second molar upward, but has not involved the distal root of the second molar.

In Fig. 624 is shown a radiogram of a case before and after extraction where there is a marked contact of the root and a crown attached to the second molar.

In Fig. 625 is shown a radiogram of a case before and after extraction where the entire mesial surface and the greater part of the mesial root is in contact with the second molar.

NO DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

Where the third molar is in a distoangular position and the mesial surface is inaccessible, the case is one of the most complicated types of impaction. The result of the operation will be questionable where the ossistructure extends over the entire tooth and no pathologic involvement is present, with no clinical symptoms to indicate either the retention or extraction of the tooth. The second molar, on account of the contact of its roots at the apical third with the roots of the third molar, is always liable to be disturbed during the operative procedure.

CLINICAL EXAMINATION

Exposed Crown.—No part of the crown is exposed.

Gum Tissue.—The gum tissue covers the entire crown.

RADIOGRAPHIC INTERPRETATION

Crown.—The crown shows a definite enamel cap and pulp chamber, and no part of the occlusal surface is visible. There is usually a large interseptum between the second and third molars.

Roots.—The mesial root of the third molar is, as a rule, in contact with the distal root of the second, and the pressure of the mesial root of the third molar upon the distal root of the second in such a case usually causes a loss of contact between the first and second molars. In the majority of cases of this kind the interseptum between the first and second molars is involved, and the second molar is not, as a rule, firmly attached to the supporting ossistructure. If, however, conditions indicate that the interseptum is normal and that the second molar can be retained, an operative procedure is followed as in a case where there is a pathologic involvement of the ossistructure around the impacted tooth. Precaution should, however, be taken not to disturb the second molar during the extraction of the impacted tooth.

The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root inclined mesially, 2; partially developed roots, 1, and mesial root inclined distally and distal root straight, 1.

Ossistructure.—The ossistructure extends over the entire crown.

OPERATIVE TECHNIC

Gum Tissue Technic.—An incision of the gum tissue is made along the entire distal surface of the second molar, followed by an incision on the buccal surface downward slightly anterior to the distal surface of the second molar. A third incision is made distally along the buccal surface of the third molar, starting at the distal surface of the second molar to a point that will permit excision of the ossistructure over the occlusal and on the mesial, distal and buccal surfaces. The incision is practically the same as illustrated for a vertical impaction where the mesial surface is inaccessible (Fig. 413, page 388).

Ossistructure Technic.—Ossisector No. 8L for the left side or No. 8R for the right side is selected. The gum tissue over the occlusal surface is displaced with the back of the blade, and the blade is directed toward the mesial surface. Excision is started at this point to excise the interseptum between the second and third molars, and along the mesiobuccal surface and the ossistructure over the occlusal surface is excised with ossisector No. 3L, 3R; No. 5L, 5R; or No. 11L, 11R, as described on page 585. The ossistructure on the distal surface is excised with ossisector No. 3L for the left side or No. 3R for the right side down to the gingival third, and thus quite a space is created on the distal surface, as described on page 584. The ossistructure on the buccal surface is excised with ossisector No. 11L for the left side or No. 11R for the right side down to a short distance above the bifurcation, as described on page 586.

Exolever Technic—Mesiobuccal Application.—When the ossistructure over the occlusal surface and on the mesial, mesiobuccal, distal and buccal surfaces has been excised, exolever No. 9L for the left side or No. 9R for the right side is applied to the mesiobuccal surface of the third molar, the tooth being directed upward and distally. While the third molar is being directed distally there is always a liability of raising the second molar out of its socket on account of the contact of the mesial root of the third molar with the distal root of the second at the apical third. This movement is, however, the only practicable method that can be followed to fracture the septum between the roots, as it cannot be fractured by a buccal application. If an attempt is made to apply forceps, the depression of the crown will not allow such an application, and, in addition, it will be necessary to excise the ossistructure on the lingual surface to allow the adjustment of the forceps. When the forceps are adjusted, an extraction movement in line with the long axis of the instrument cannot be executed, and the forceps will carry away a large part of the lingual plate.

Buccal Application.—When the impacted tooth has been loosened by directing it upward and distally by a mesiobuccal application, exolever No. 10L for the left side or No. 10R for the right side is applied to the buccal surface at the bifurcation to complete the extraction, as described for a buccal application, page 591.

SUMMARY OF CASES

In the case shown in Fig. 626 A, where the mesial root is inclined distally and the distal root is straight, the mesial root of the third molar impinges upon the distal root of the second, with a pathologic condition involving the interseptum between the first and second molars. The ossistructure extends over the entire tooth, and the extraction is executed according to the technic described above.

In the case shown in Fig. 626 B the condition is similar to that shown in Fig. 626 A, except that there is a greater amount of ossistructure on the mesial surface and greater resistance will be encountered on account of the character of the formation of the roots and the septum between them.

A B

Fig. 626. — Distoangular Impaction—No Deflection—Mesial Surface Inaccessible. *A*, mesial root inclined distally and distal root straight, with ossistructure extending over entire tooth; *B*, mesial root inclined distally and distal root inclined mesially, with ossistructure extending over entire tooth.

BUCCAL DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

Where the third molar is impacted in a distoangular position, with the buccal surface out of alignment buccally with the corresponding surface of the second molar, a part of the mesial surface of the third molar is usually accessible to the application of the exolever, and rarely is a case seen where the tooth is in such a position and the mesial surface is inaccessible.

CLINICAL EXAMINATION

Exposed Crown.—As a rule, no part of the crown is exposed, but, should there be any exposure, it will be that part of the mesial surface of the third molar that is deflected buccally out of alignment

with the distobuccal surface of the second or a small part of the occlusal surface of the third molar.

Gum Tissue.—The description above in regard to the exposed crown will apply to the condition of the gum tissue.

RADIOGRAPHIC INTERPRETATION

Crown.—The enamel cap and pulp chamber are definitely outlined, and no part of the occlusal surface is visible. The contact of the third molar with the second shows an overlap, indicating a buccal deflection. The contact of the first molar with the second shows no overlap, checking the overlap of the third molar, and the contact of the latter tooth is usually above the gingival third of the second molar.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: both roots straight, 2; both roots inclined distally, 2; mesial root inclined distally and distal root straight, 2; mesial root inclined distally and distal root inclined mesially, 2; divergent roots, 2; partially developed roots, 1, and fused roots, 2.

Ossistructure.—Rarely is a case of this type of impaction found where a pathologic condition has not involved the ossistructure over the occlusal and on the distal surface, a condition that is probably due to the deflected crown, and, when a small part of the mesial surface or occlusal surface is exposed through the gum tissue, the area is subject to infection. The infection does not, as a rule, destroy the ossistructure in this region, as it does in a vertical impaction, to the extent of obviating an excision. The ossistructure usually extends over the distoclusal surface, and there is a variation in the amount of structure over the surface. The mesial third of the buccal surface may be free of ossistructure, or the structure may extend over the greater part of this surface. The mesial surface is usually free of ossistructure down to the gingival third.

OPERATIVE TECHNIC

Gum Tissue Technic.—If the mesioclusal surface is exposed, it is used as a guide for the incision. If this part of the tooth is not exposed, the incision is started at that part of the mesial surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second, and is continued downward and buccally along the mesial surface of the third molar. As the blade follows the mesial surface buccally, the lancet is used to locate the buccal surface, and from this point incision of the gum tissue is made

distally along the buccal surface to permit excision of the ossistructure on the distal surface and to allow the application of the exolever to the buccal surface. The incision is practically the same as for a vertical impaction where there is a buccal deflection and the mesial surface is accessible (Fig. 422, page 399).

Ossistructure Technic—Occlusal Excision.—As the ossistructure extends over the distoclusal surface, excision of this structure is the first step in the operative procedure which follows, as is described on page 585. When making the adjustment of the blade before directing it toward the occlusal surface, the operator should be certain that the blade is over the center of the surface, as the crown is deflected buccally. As the ossistructure over the occlusal surface is usually involved by a pathologic condition, it is not difficult to excise, and the operator should be certain that no part of the ossistructure remains.

Distal Excision.—Excision of the ossistructure on the distal surface is made, and, as a pathologic condition usually involves this surface, excision is not difficult on account of the fact that the pathologic changes have weakened the structure. No dependence can, however, be placed on the involved area, and excision is made as described on page 584, as if no pathologic condition were present, the ossistructure being excised down to the gingival third to decrease resistance at this point.

Buccal Excision.—Where the root formation indicates that, by the application of the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to direct the tooth distally and upward, it can be directed out of its socket to a point where the superior border of the ossistructure on the buccal surface will not interfere with the application of the exolever to this surface, no excision will be necessary. Where this procedure is not practicable, excision is made to gain access for the application of the exolever to the buccal surface, and it is not infrequent to find that pathologic changes have involved this surface, and the excision is made as described on page 586. The blade is directed toward the bifurcation with the expectation that there may be a space between the buccal surface and the ossistructure on this surface into which the blade can be inserted. If such a space exists, and it will permit the insertion of the exolever, the ossisector is withdrawn. If, however, there is no space, excision is started at the superior border of the ossistructure, the blade being directed toward the buccal surface, and is continued downward to a point where an adjustment of the exolever can be made. The amount of excision is governed by the distance that the tooth can be directed distally and upward out of its socket

when the exolever movements are applied to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar and by the location of the bifurcation in its relation to the superior border of the ossistructure.

Exolever Technic—Mesial Application.—An incision of the gum tissue in the region of the mesial surface of the third molar will indicate to what extent part of this surface is deflected buccally out of alignment with the distobuccal surface of the second molar, and to what extent the mesial surface of the third molar is available for the application of the exolever, so that an exolever can be properly applied to the mesial surface. Exolever No. 6L for the left side No. 6R for the right side is selected, the gum tissue over that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar is displaced with the back of the blade, and the blade is sent down on this surface to create a wedge between the mesial surface and the ossistructure, as illustrated for a vertical impaction (Figs. 424, 425, pages 401, 403). The tooth is extracted or loosened by the latter procedure and directed distally and upward to a position where a buccal application can be made to complete the extraction. Where the roots offer resistance the blade is directed to a point where a more secure adjustment can be obtained. When the exolever is securely adjusted, the handle is directed mesially or distally with sufficient pressure to raise the tooth distally and upward out of its socket. This movement is repeated as may be necessary, and each time the blade is sent farther down on the mesial surface for the purpose of directing the tooth distally and upward out of its socket and at the same time fracturing the septum between the roots when such a procedure is indicated.

Buccal Application.—When the bifurcation of the tooth has been raised to a point where it is at or above the superior border of the ossistructure and allows the application of exolever No. 10L for the left side or No. 10R for the right side, the exolever is adjusted to the buccal surface at the bifurcation, when the handle of the exolever is pressed downward and turned to a slight extent buccally, which movement will extract the tooth. The procedure is as described on page 591.

SUMMARY OF CASES

In the cases shown in Fig. 627, where both roots are inclined distally, there is a variation in the relation of the mesial root of the third molar to the distal root of the second. There is a variation in the amount of ossistructure over the distoclusal surface, which is excised, after which an excision of the ossistructure on the distal

surface is made. The exolever is adjusted to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to direct the tooth distally and upward to a point where the curvature of the roots will be overcome, when an application of the exolever to the buccal surface is made to complete the extraction.

Fig. 627. — Distoangular Impaction—Buccal Deflection—Mesial Surface Accessible. Both roots inclined distally. The ossistructure extends over distoclusal surface and entire distal surface, with variation in ossistructure on lingual and buccal surfaces.

In the cases shown in Fig. 628, where the mesial root is inclined distally and the distal root is straight, the condition for extraction is more favorable, on account of the character of the root formation, than in the cases shown in Fig. 627. The technic is the same as is described for the latter cases.

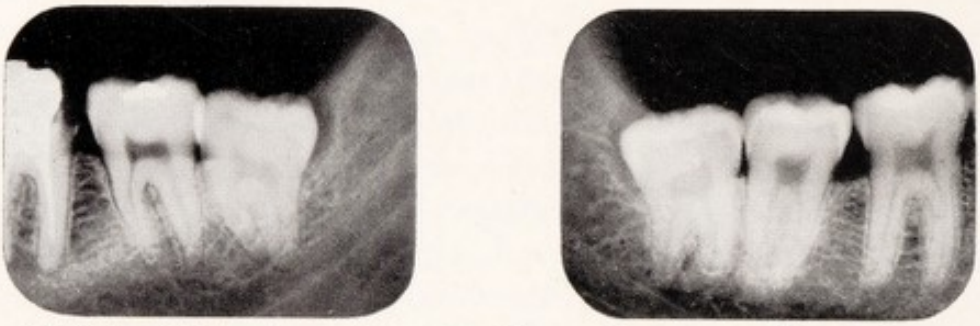


Fig. 628. — Distoangular Impaction—Buccal Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight. The ossistructure extends over distoclusal surface and entire distal surface, with variation in ossistructure on lingual and buccal surfaces.

In the cases shown in Fig. 629, where the mesial root is inclined distally and the distal root is straight, the ossistructure on the distal surface is involved by a pathologic condition and no excision is indicated. The exolever is adjusted to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to direct the tooth distally far enough to overcome the curvature of the mesial root but not too far or there may be a fracture of the straight distal root. The contact of the roots will also govern the distance that the tooth can be directed upward and distally, and the extraction is completed by a buccal application.

Fig. 629. — Distoangular Impaction—Buccal Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with a contact of roots. The ossistructure on distal surface is involved by a pathologic condition and greater part of lingual and buccal surfaces free of ossistructure.

In the cases shown in Fig. 630, where the roots are divergent, the ossistructure over the distoclusal surface is excised, after which an excision is made on the distal surface, and the excision on the buccal surface should be sufficient to insure a secure adjustment of the exolever. When the exolever is adjusted to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to loosen the tooth, the nature of the contact of the mesial root of the third molar with the distal root of the second will govern the distance that the tooth can be directed distally and upward without causing a loss of the second molar. This distal movement will reduce the resistance of the septum between the roots and avoid a fracture of them. When the tooth has been slightly loosened by the application of the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, and this surface has cleared the distal surface of the second molar, a buccal application is made to direct the tooth farther upward out of its socket, after which the mesial application is again made; alternately repeating the mesial and buccal applications as may be necessary will often avoid a fracture of the roots.

In the cases shown in Fig. 631, where the mesial root is inclined distally and the distal root is inclined mesially, the procedure is the same as in the cases shown in Fig. 630. The resisting septum between

Fig. 630. — Distoangular Impaction—Buccal Deflection—Mesial Surface Accessible. There is a variation in root formation, with ossistructure extending over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

the roots is the factor to be overcome when directing the tooth distally, and no dependence can be placed on a buccal application until the septum between the roots has been fractured when the tooth is being directed distally and upward.

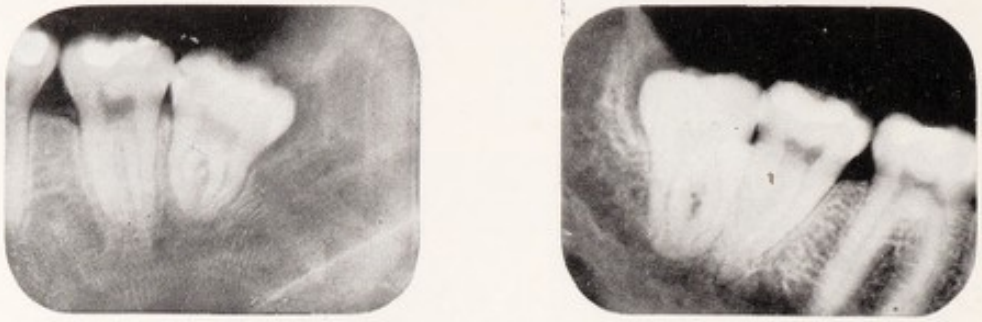


Fig. 631. — Distoangular Impaction—Buccal Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially, with ossistructure extending over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

In the cases shown in Fig. 632, where there is a variation in the root formation and the greater part of the mesial root of the third molar is in contact with the distal root of the second, extensive excision over the occlusal surface and on the distal surface is indicated, and also excision on the buccal surface slightly distal to the bifurcation. The third molar is directed distally and upward with caution from its contact with the second molar, and the extraction is completed by a buccal application. The buccal deflection is advantageous for adjusting the exolever to direct the tooth distally into the space created by the excision on the distal surface, but too great a pressure on that part of the mesial surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second is liable to dislodge the second molar if the operator attempts to direct forcibly the tooth distally.

In Fig. 633 are shown lingual and occlusal radiograms of the same case. In Fig. 633 A the mesial root is inclined distally and the distal root is straight, with the ossistructure extending over the distoclusal surface, the entire distal surface and the greater part of the lingual and buccal surfaces. The contact of the mesial surface of the mesial root of

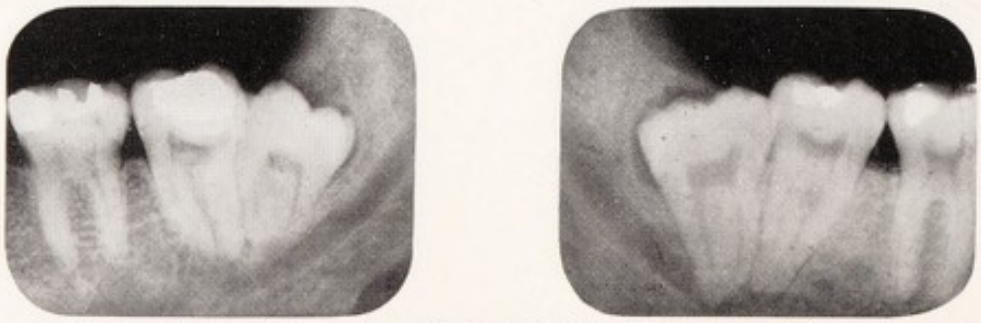
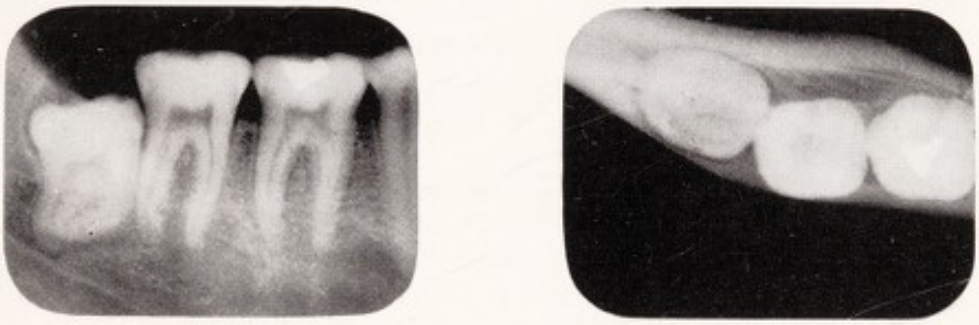


Fig. 632. — Distoangular Impaction—Buccal Deflection—Mesial Surface Accessible. The roots are varied in formation and in contact with second molar, with ossistructure extending over greater part of occlusal surface, entire distal surface and greater part of lingual and buccal surfaces.

the third molar with the distal surface of the distal root of the second has caused the third molar to be slightly deflected distally, so that no definition of the buccal deflection can be obtained. In Fig. 633 B the extent of the deflection of the buccal surface of the third molar out of alignment buccally with the corresponding surface of the second can be determined.

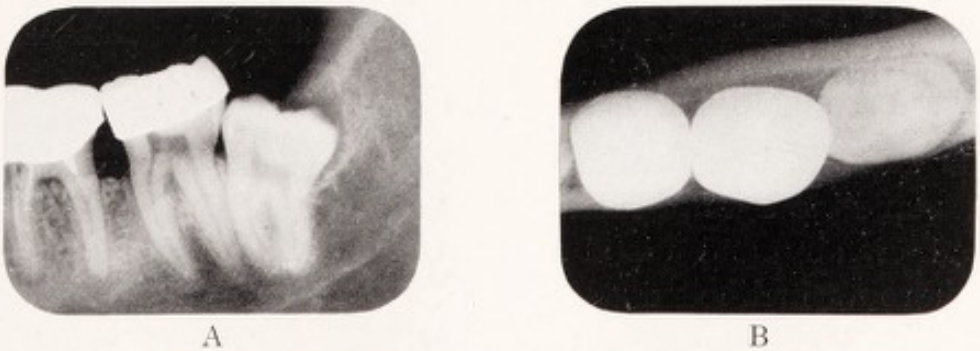
Excision of the ossistructure over the occlusal surface and on the distal and buccal surfaces is indicated. No excision is made along that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, as a small part of this surface extends above the superior border of the ossistructure, and excision would decrease the value of the available fulcrum. The blade of the exolever is wedged between the ossistructure and that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar. The exolever movements should be made with caution, and the tooth is directed upward and distally far enough to overcome the curvature of the mesial root, when the extraction is completed by a buccal application.



A B

Fig. 633. — Distoangular Impaction—Buccal Deflection—Mesial Surface Accessible. Same case. *A*, lingual radiogram where no positive definition of a buccal deflection can be determined; *B*, occlusal radiogram which shows a buccal deflection.

In Fig. 634 are shown lingual and occlusal radiograms of the same case. The case is similar to that shown in Fig. 633 except that a gold crown is attached to the second molar and there is a slight contact of the mesial surface of the third molar with the distal surface of the second, but no overlap is shown.



A B

Fig. 634. — Distoangular Impaction—Buccal Deflection—Mesial Surface Accessible. Same case. *A*, lingual radiogram; *B*, occlusal radiogram.

BUCCAL DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

Where the third molar is in a distoangular position, with the buccal surface out of alignment buccally with the corresponding surface of the second, and the mesial surface is inaccessible to the application of the exolever, the procedure is the same as in a case where there is a buccal deflection and where the mesial surface is accessible (page 603), except that access is obtained by excising the ossistructure along that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar and is inaccessible to the application of the exolever. This excision is similar to excising for access where, in a vertical impaction, the mesial surface is inaccessible and there is a buccal deflection (page 413).

LINGUAL DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

Where the third molar is in a distoangular position, with a lingual deflection, the buccal surface is deflected to a slight extent lingually out of alignment with the corresponding surface of the second molar, and the occlusal surface of the third is deflected to a slight extent lingually.

CLINICAL EXAMINATION

Exposed Crown.—As a rule, no part of the crown is exposed, but, should there be any exposure, it will be the buccoclusal surface.

Gum Tissue.—The description above in regard to the exposed crown will apply to the condition of the gum tissue.

RADIOGRAPHIC INTERPRETATION

Crown.—A part of the occlusal surface of the third molar is visible. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these two teeth is visible. No part of the mesial surface of the third molar is, as a rule, in contact with the distal surface of the second, but, if there is such a contact, it is very slight.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root straight, 7; both roots straight, 2; both roots inclined distally, 2; mesial root inclined distally and distal root inclined mesially, 2; partially developed roots, 1, and fused roots, 2.

Ossistructure.—The distal surface of the third molar is seldom free of ossistructure, but, where the occlusal surface of the third molar is not very far below the corresponding surface of the second, the ossistructure on the distal surface of the third molar is usually involved by a pathologic condition. In the majority of cases the ossistructure extends over the occlusal surface of the third molar, and the ossistructure on the buccal surface is not so heavy as where this surface is in alignment with the corresponding surface of the second, or where the buccal surface of the third molar is deflected buccally out of alignment with the corresponding surface of the second. The greater part of the buccal surface is, however, usually covered by ossistructure. The mesial surface is, as a rule, free of ossistructure from the occlusal surface down to the gingival third, except where in a rare case there is a large interseptum between the second and third molars.

OPERATIVE TECHNIC

Gum Tissue Technic.—Where the bulging of the gum tissue over the occlusal surface of the third molar indicates the location of the buccoclusal surface, the incision of the gum tissue is started at the mesial surface, which follows distally the buccal surface at the occlusal

Fig. 635. — Occlusal Excision of Ossistructure—Distoangular Impaction —Lingual Deflection—Mesial Surface Accessible. Ossisector No. 11R applied for excision of ossistructure over lingual fourth of occlusal surface.

surface, and is continued distally far enough to permit excision on the distal surface. Where the clinical examination does not indicate the location of the buccoclusal surface, the incision is made distally in line with the center of the distal surface of the second molar, by which procedure the buccoclusal surface is usually located. A slight incision is made buccally and downward from the first incision on the buccal half of the distal surface of the second molar. The incision

is practically the same as illustrated for a vertical impaction, lingual deflection (Fig. 441, page 419).

Ossistructure Technic—Occlusal and Distal Excisions.—The ossistructure over the occlusal and distal surfaces is excised with ossisector No. 3L or 5L for the left side or No. 3R or 5R for the right side, as described on pages 584, 585. The gum tissue over the occlusal surface is displaced with the back of the blade of the ossisector, the blade being kept in line with the lingual deflection of the occlusal surface. After the ossistructure has been excised over the distoclusal and distal surfaces, if small ledges remain over the lingual fourth of the occlusal surface and are not excised, they will prove to be resisting factors when the exolever is applied. This procedure is executed with ossisector No. 11L or 11R by directing the blade, with pressure under control, between the occlusal surface and the superior border of the ossistructure. Where the ossistructure is not extensive over the distoclusal surface and extends over the lingual fourth of the occlusal surface both excisions can then be made with ossisector No. 11L or 11R, as illustrated in Fig. 635.

Buccal Excision.—The lingual deflection of the tooth is favorable for excision of the ossistructure on the buccal surface, and this structure is not, as a rule, very heavy, being readily excised. Ossisector No. 11L for the left side or No. 11R for the right side is selected, and the blade is adjusted on the buccal surface at the superior border of the ossistructure to determine whether there is a space between the buccal surface and the ossistructure at this point. If there is no such space, the ossistructure on the buccal surface is excised down to a point where the exolever can be adjusted to this surface at the bifurcation, as described on page 586.

Exolever Technic—Mesiobuccal Application.—As the tooth is deflected to a slight extent lingually, the final exolever movements are made in this direction, and, as the lingual deflection of the tooth places the mesiobuccal surface of the third molar in a position lingual to the distobuccal surface of the second, exolever No. 9L for the left side or No. 9R for the right side is selected. The gum tissue on the mesiobuccal surface is displaced with the back of the blade, and the blade is directed downward along the mesiobuccal surface of the third molar, as described on page 589. If both roots are inclined distally, the distal exolever movement will extract the tooth. If, however, the mesial root is inclined distally and the distal root is straight, the tooth is directed distally far enough to overcome the curvature of the mesial root, but not so far as to fracture the straight distal root, when a buccal application of the exolever is made. Seldom is a case seen where the mesial root is inclined distally and the

distal root is inclined mesially, but, in case such a condition is presented, sufficient force is applied distally to fracture the septum between them.

Buccal Application.—When the tooth has been sufficiently loosened, exolever No. 10L for the left side or No. 10R for the right side is applied in alignment with the buccal surface, as illustrated in Fig. 636. With the instrument in this position pressure is applied downward on the handle and a wedge movement is made between the buccal surface and the ossistructure on this surface in an effort to extract the tooth. If, by this procedure, the tooth is not extracted, the handle of the exolever is again pressed downward and then turned buccally,

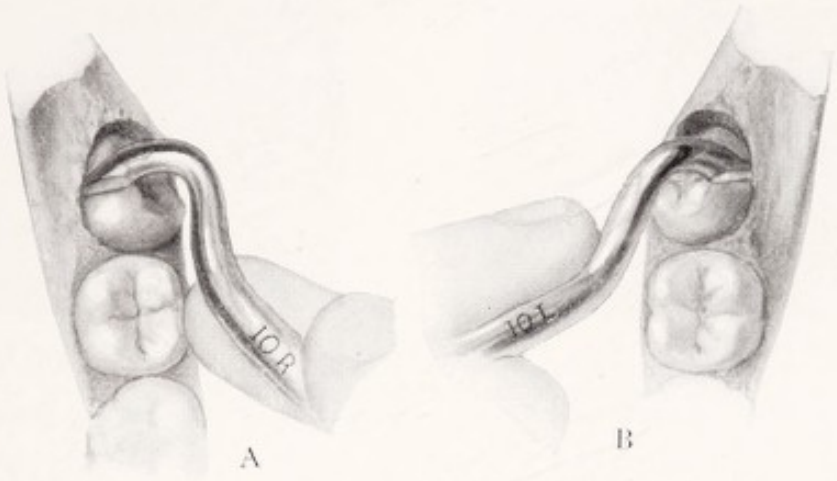


Fig. 636. — Buccal Application of Exolever—Distoangular Impaction—Lingual Deflection—Mesial Surface Accessible. *A*, exolever No. 10R applied in alignment with buccal surface on right side; *B*, application on left side.

with the point of the instrument engaging the bifurcation, and this movement is repeated as may be necessary, the blade being sent farther down with each repetition until the tooth has been extracted. Where there is a root contact or the roots are short, a buccal application independent of a mesiobuccal application can be made to complete the extraction.

SUMMARY OF CASES

In the cases shown in Fig. 637, where the mesial root is inclined distally and the distal root is straight, pathologic changes have involved the ossistructure on the mesial, distal, lingual and buccal surfaces. Excision over the distoclusal surface is made, but no excision on the distal surface is indicated, and, in order to secure a fulcrum, excision is made on the buccal surface at the bifurcation. The tooth is directed upward and lingually by a buccal application and no mesiobuccal application of the exolever is indicated.

In the cases shown in Fig. 638, where the mesial root is inclined distally and the distal root is straight, with the ossistructure extending over the distoclusal surface, excision of the ossistructure over this

surface and on the distal and buccal surfaces is indicated. Some resistance will be encountered on account of the root formation when the tooth is directed distally by the application of the exolever to the mesiobuccal surface, and pressure under control should be exerted distally and lingually when making the exolever movements, after which a buccal application is made to complete the extraction. The second molar will always be endangered on account of the contact of the roots, but, if precaution is taken not to apply too great a pressure when making the mesiobuccal application with the object of only loosening the tooth, and dependence is placed on the buccal application to extract the tooth, the second molar is seldom loosened.

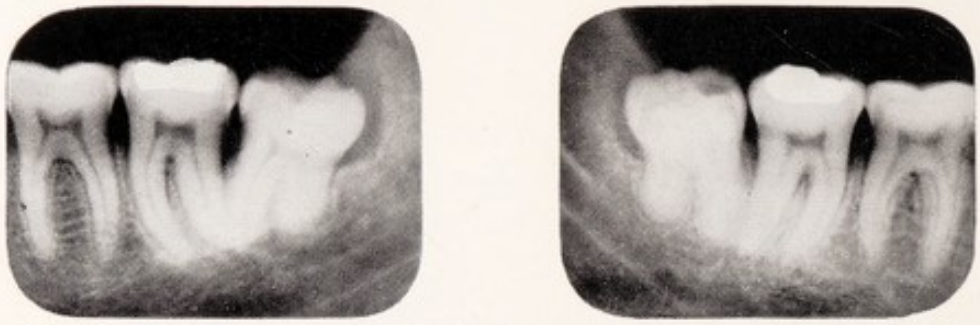


Fig. 637. — Distoangular Impaction—Lingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with pathologic condition involving ossistructure on mesial, distal, lingual and buccal surfaces. The ossistructure extends over distoclusal surface and greater part of lingual and buccal surfaces.

In the cases shown in Fig. 639, where the greater part of the mesial root of the third molar is in contact with the distal root of the second molar, the execution of any kind of technic is always liable to endanger the second molar, as there is a probability of an absorption on the distal root of the latter tooth, due to the pressure of the third molar, but this condition cannot be determined in advance from the radiogram. The ossistructure over the distoclusal surface is excised in advance of the structure on the distal and buccal surfaces. No attempt should be made to apply the exolever to the mesial surface, as this procedure will loosen the second molar; the entire extraction is executed with a buccal application.

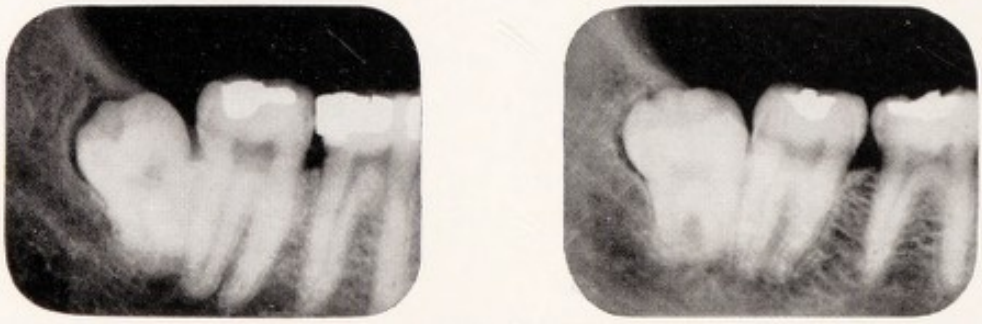
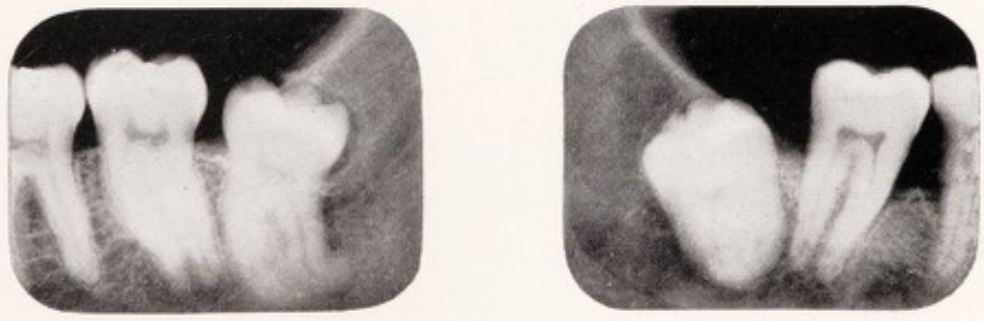


Fig. 638. — Distoangular Impaction—Lingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root straight, with ossistructure extending over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

In the case shown in Fig. 640 A, where both roots are inclined distally, there is a large interproximal space between the second and third molars. The ossistructure extends over the distal half of the occlusal surface, which is excised in advance of the excision on the distal surface. No excision is indicated on the buccal surface, as the application of the exolever on account of the existing space can be made advantageously upon the mesiobuccal surface, the tooth being directed upward to a distance where a buccal application can be made to complete the extraction.

Fig. 639. — Distoangular Impaction—Lingual Deflection—Mesial Surface Accessible. The root formation is varied, and mesial root of third molar is in contact with distal root of second. The ossistructure extends over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces.

In the case shown in Fig. 640 B, where the mesial root is inclined distally and the distal root is inclined mesially and fused, there is a large interproximal space between the second and third molars. The ossistructure extending over the entire occlusal, distal and buccal surfaces is excised, but no excision is necessary to gain access to the mesiobuccal surface. The interseptum between the first and second molars is involved by a pathologic condition. Exolever No. 9L for the left side or No. 9R for the right side is selected, and, when the instrument is adjusted to the mesiobuccal surface, with the ossistructure anterior to this surface utilized as a fulcrum, the tooth is loosened by this application. No attempt should, however, be made



A B

Fig. 640. — Distoangular Impaction—Lingual Deflection—Mesial Surface Accessible. *A*, both roots inclined distally. The ossistructure extends over distoclusal surface, entire distal surface and greater part of lingual and buccal surfaces; *B*, roots fused. The ossistructure extends over entire tooth, with exception of a part of mesial surface, and a pathologic condition involves interseptum between first and second molars.

to direct the tooth distally, as such a movement will endanger the second molar, and the extraction is completed by a buccal application. The operator should, before making the buccal application or when excising the ossistructure on the buccal surface, be certain that this surface has been freed of ossistructure to a point that will allow a buccal application and that sufficient ossistructure remains to serve as a fulcrum.

In Fig. 641 are shown two radiograms of the same case and a photograph of the extracted tooth.

In Fig. 641 A the contact of the roots of the third molar with the distal root of the second indicates that no attempt should be made

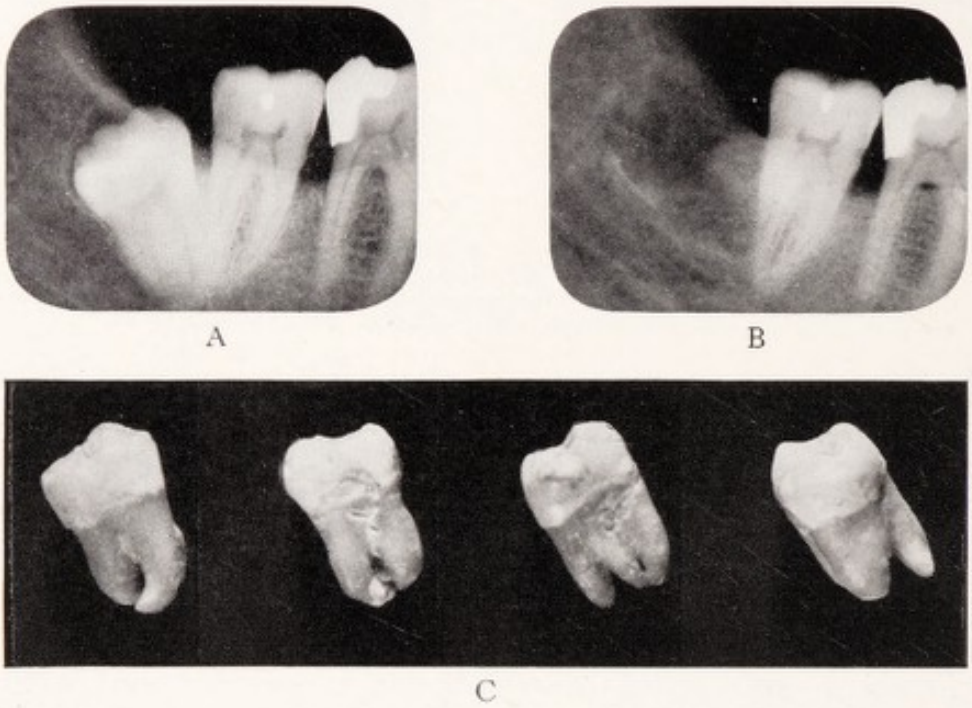


Fig. 641. — Distoangular Impaction—Lingual Deflection—Mesial Surface Accessible. *A*, tooth deflected lingually and roots in contact with distal root of second molar, with slight pathologic condition of interseptum between first and second molars; *B*, case after extraction, revealing condition of socket and distal root of second molar; *C*, four different views of extracted tooth.

to extract the tooth by applying the exolever to the mesiobuccal surface of the third molar, utilizing the second molar as a fulcrum, as this procedure would endanger the second molar. The ossistructure over the entire occlusal surface and on the buccal surface should be excised sufficiently to permit an application of the exolever at the bifurcation. After the ossistructure has been excised, the operator should be certain that no overhanging ledges remain on the lingual fourth of the occlusal surface, as frequently in a case of failure to extract the tooth the ossistructure in this area has been overlooked, and, if an attempt is made to apply the exolever technic the ossistructure at this point will be a resisting factor and interfere with the exolever movements. When the operator is certain that the

entire occlusal surface is free of ossistructure and that the exolever can be adjusted on the buccal surface at the bifurcation, he should follow this technic independent of the use of the second molar as a fulcrum or a mesiobuccal application and complete the extraction by a buccal application.

In Fig. 641 B is shown the socket after the extraction and also the condition of the distal root of the second molar, which has not been affected by the extraction.

In Fig. 641 C are shown four different views of the extracted tooth where more than the normal number of roots are shown. The contact of the roots of the third molar with the roots of the second causes the roots to be superimposed so that it is impossible to obtain a definite diagnosis of the root formation.

LINGUAL DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

It would be extremely rare to find a lingual deflection in this type of case, with the mesial surface inaccessible, and excision over the occlusal, distal and buccal surfaces is made as described for ossistructure technic where the mesial surface is accessible (page 584). Excision for access to the mesiobuccal surface is indicated as in a case of vertical impaction, with a lingual deflection, and where the mesiobuccal surface is inaccessible (page 433), and the exolever technic is executed as described for a case where the mesial surface is accessible (page 610).

SUMMARY OF CASES

In the case shown in Fig. 642 there is quite a distance between the distal surface of the second molar and the corresponding surface of the third, indicating increased difficulty when excising the ossistructure on the distal surface of the third molar. Excision over the entire occlusal surface, on the buccal surface slightly distal to the bifurcation and on the mesiobuccal surface is also indicated. The exolever is applied to the mesiobuccal surface to direct the tooth upward and slightly lingual, so that a buccal application can be made to complete the extraction.

Fig. 642. — Distoangular Impaction—Lingual Deflection—Mesial Surface Inaccessible. There is quite a distance between distal surface of third molar and corresponding surface of second, with ossistructure extending over entire tooth.

BUCCOLINGUAL DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE OR INACCESSIBLE

A case where the third molar in in a distoangular position, with the buccal surface out of alignment buccally with the corresponding surface of the second, and where the occlusal surface of the third molar is deflected to a slight extent lingually, with part of the surface impinging upon the distobuccal surface of the second, and with the mesial surface accessible or inaccessible, would be extremely rare. In the author's experience of collecting many thousands of radiograms of every imaginable character, no impaction of this type was seen. If, however, a case of the kind described should occur, the technic would be similar to a vertical impaction with a buccolingual deflection (page 437), except that greater excision over the occlusal surface and on the distal and buccal surfaces would be indicated.

TORSIONAL DEFLECTION, WITH THE SURFACE THAT WOULD NORMALLY BE THE MESIAL SURFACE ACCESSIBLE

Where the third molar is impacted in a distoangular position, with a torsional deflection, the surface that would normally be the mesial is usually accessible, but in an extremely rare case this surface may be inaccessible. The occlusal surface is usually deflected lingually, and this condition should always be checked with an occlusal radiogram, as in an occasional case the opposite condition may be presented, where the occlusal surface is deflected buccally.

CLINICAL EXAMINATION

Exposed Crown.—As a rule, no part of the crown is exposed.

Gum Tissue.—The gum tissue usually covers the entire crown.

RADIOGRAPHIC INTERPRETATION

Crown.—Where the tooth is in a torsional position, the distal inclination is usually very marked. The pulp chamber and canals are usually obliterated, or only a small spot is shown instead of an approximately normal pulp chamber.

Roots.—As a rule, no positive definition of the root formation can be obtained from the radiogram on account of the torsional deflection of the tooth. The roots will often have the appearance of being fused, but this condition is not usually verified until the extracted tooth is examined, and sometimes there will be two normally developed roots. The mesial root of the third molar is usually in contact with the distal root of the second.

Ossistructure.—The greater part of the tooth is usually covered by ossistructure, leaving exposed only a small part of what would normally be the mesial surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—Where the tooth is in a torsional position in this type of impaction it is usually deflected lingually. In the majority of these cases the clinical findings show that the surface that would normally be the mesial surface of the third molar is located at the surface that would normally be the buccal, and also that the surface that would normally be the buccal is located at the surface that would normally be the distal. An incision is made distally from the center of the distal surface of the second molar as far as may be necessary, dependence being placed on the size of the crown, the ossistructure to be excised and the application of the exolever on the surfaces determined by the torsional position. A second incision is made along the entire surface that would normally be the mesial.

Ossistructure Technic—Occlusal, Distal and Buccal Excisions.—As no positive definition of the location of the buccal surface can be obtained until sufficient ossistructure has been excised, ossisector No. 3L, 3R; No. 5L, 5R; or No. 11L, 11R is selected. The gum tissue over the occlusal surface is displaced with the back of the blade, and the blade is directed toward the ossistructure over the occlusal surface, and is kept in alignment with the latter surface. The ossistructure over the occlusal surface is excised as described on page 585, the operator being certain that no overhanging ledges remain. The blade is then directed toward the surface that would normally be the distal, on which surface excision is made as described on page 584. Excision of the ossistructure on the surface that would normally be the buccal surface is made as described on page 586, and, as the structure is not very dense on this surface, sufficient excision is readily made.

Exolever Technic—Mesiobuccal and Buccal Applications.—When the ossistructure on the surface that would normally be the buccal or the distal is being excised, some information is usually gained as to the location of the bifurcation. Exolever No. 9L for the left side or No 9R for the right side is adjusted to the surface that would normally be the mesiobuccal, and the tooth is directed to a slight extent distally, upward and lingually to loosen it.

The contact of the mesial root of the third molar with the distal root of the second always endangers the latter tooth, and the exolever movement to loosen the third molar should be made with caution. The probable resistance of the roots, on account of a lack of definition of their formation, is always problematical, dependence being placed

on a buccal application after the tooth has been loosened, and exolever No. 10L for the left side or No. 10R for the right side is selected. The exolever is applied to the buccal surface at the bifurcation, which is usually at the surface that would normally be the distal, and the blade is wedged between the buccal surface and the ossistructure on this surface. The handle of the exolever is turned distally, the movement being repeated as may be necessary to extract the tooth. Where the bifurcation is distal to its normal position, the application of the exolever is made at that point.

SUMMARY OF CASES

In the cases shown in Fig. 643 there is a variation in the size of the crown and the character of the root formation cannot be positively determined. The ossistructure extends over the greater part of the occlusal surface and on the surfaces that would normally be the distal and buccal, excision of this ossistructure being indicated. The surface

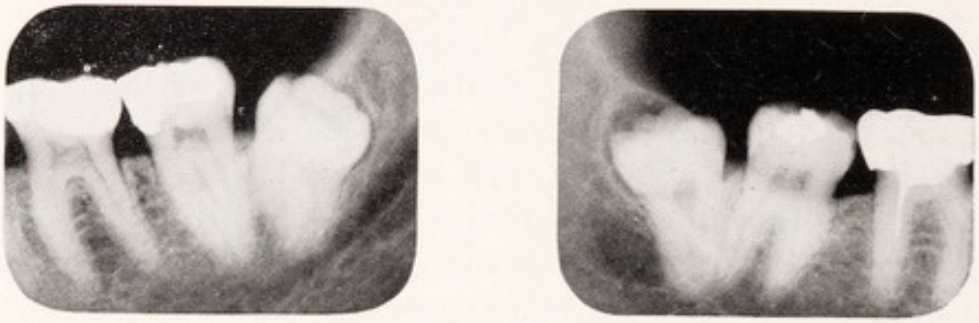


Fig. 643. — Distoangular Impaction—Torsional Deflection, with Surface that Would Normally be Mesial Surface Accessible. No positive definition of root formation can be obtained on account of torsional deflection, with ossistructure extending over greater part of occlusal surface, entire surface that would normally be distal and greater part of surfaces that would normally be lingual and buccal.

that would normally be the mesiobuccal is accessible to the application of the exolever, and the tooth is directed distally far enough to overcome the resistance of the roots, when a buccal application is made at the bifurcation, which may be anywhere from what would be its approximately normal position to a point in the center of the surface that would normally be the distal. The exolever engages the buccal surface at the bifurcation, and, by a movement applicable to the location of the bifurcation, the extraction movement is made as advantageously as circumstances will permit.

TORSIONAL DEFLECTION, WITH THE SURFACE THAT WOULD NORMALLY BE THE MESIAL SURFACE INACCESSIBLE

Where the third molar is impacted in a distoangular position, with a torsional deflection, and where the mesial surface is inaccessible, the radiographic findings are the same as where the mesial surface is acces-

sible (page 616), except that the ossistructure extends over the entire surface that would normally be the mesial. The operative procedure is the same as in the case to which reference is made, except that the ossistructure on the surface that would normally be the mesiobuccal is excised sufficiently to apply the exolever to this surface, which excision is made as described for a vertical impaction (page 389).

SUMMARY OF CASES

In Fig. 644 A is shown a case of distoangular impaction with a torsional deflection, and where the surface that would normally be the mesial is inaccessible. Excision is indicated over the entire occlusal surface and on the surfaces that would normally be the mesiobuccal, distal and buccal. The contact of the roots indicates that precaution

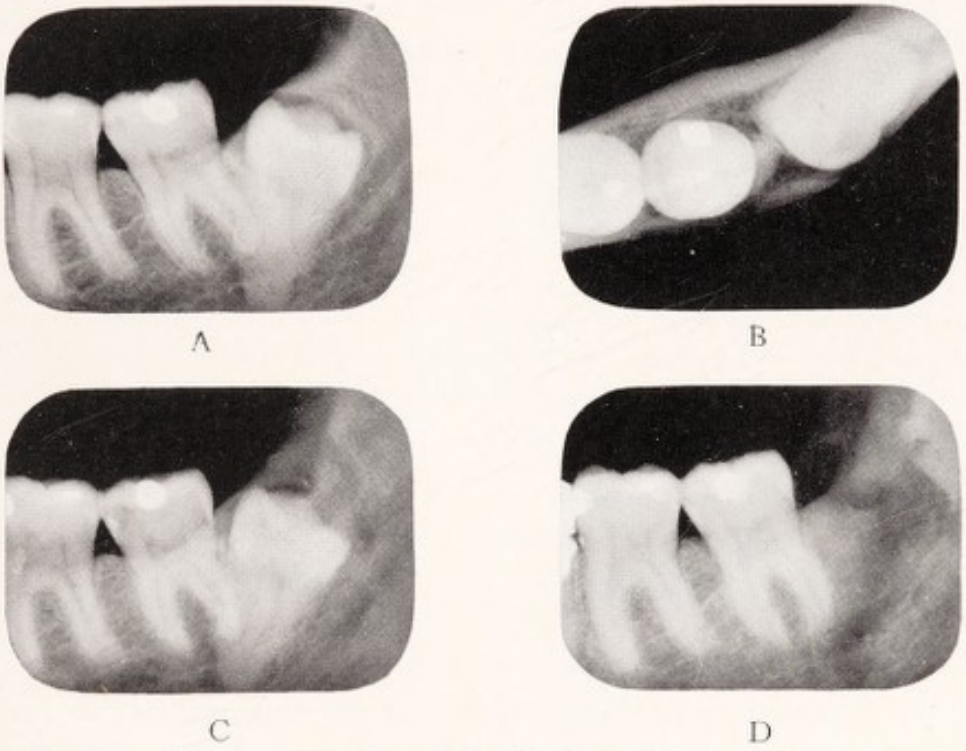


Fig. 644. — Distoangular Impaction—Torsional Deflection, with Surface that Would Normally be Mesial Surface Inaccessible. *A*, no positive definition of roots can be obtained on account of torsional deflection, with ossistructure extending over entire tooth; *B*, occlusal view; *C*, ossistructure excised over entire occlusal surface before tooth was removed; *D*, socket after extraction.

should be taken when the adjustment of the exolever is made to the surfaces that would normally be the mesiobuccal and buccal so as not to endanger the second molar. In Fig. 644 B the occlusal radiogram shows the alignment, but the distal part of the crown is distorted on account of the bending of the film. In Fig. 644 C is shown a radiogram made after the ossistructure was excised over the entire occlusal surface before the tooth was removed. In Fig. 644 D is shown the socket after extraction.

ISOLATED POSITION, WITH THE MESIAL SURFACE ACCESSIBLE OR INACCESSIBLE

The technic for an isolated distoangular impaction is the same as in a case where the second molar is *in situ*, as the excision is the same. The exolever is applied to the mesiobuccal and buccal surfaces and not to the greater part of the mesial surface as would be indicated where the tooth is isolated in a vertical position.

CHAPTER XIX

Operative Technic in Horizontal Impaction

WHERE it is shown by the clinical examination and radiographic interpretation that the mandibular third molar is impacted in a horizontal position, the technic for extraction, when such a procedure is indicated, should be executed in conformity with the position of the tooth, its root formation, its supporting ossistructure and its relation to the second molar. While the impacted tooth is described as being in a horizontal position, its buccal surface may be in alignment with the corresponding surface of the second molar, or the tooth may be deflected buccally, lingually or buccolingually, and in an occasional case there may be a torsional deflection.

A horizontal impaction occurs as frequently as a vertical or mesioangular impaction. As is the case in a vertical, mesioangular and distoangular impaction, the object to be attained is the elimination of the forceps on account of the extensive excision necessary to make an adjustment to the lingual and buccal surfaces; and, in addition, it was found impossible, when the forceps were adjusted, to execute the extraction movements in conformity with the root formation. Excising the entire buccal plate in order to be able to extract the impacted tooth, a procedure usually followed, is objectionable for the reason that it often makes an extensive excision of the ossistructure necessary at a point where it is dense and difficult of access, necessitating an excision of the septum between the roots, as the latter will interfere with directing the tooth buccally, and this will be the case even after the entire buccal plate has been excised.

If the operator excises the ossistructure on the distal surface and provides access for the exolever to the mesial surface, no extensive excision on the buccal surface will be necessary, as the movements with the exolever can be executed in such a way as to overcome the resistance of the septum between the roots. Where the buccal surface of the third molar is in alignment with the corresponding surface of the second, with a lingual or buccolingual deflection, and where the mesial surface is inaccessible to the immediate application of the exolever, only sufficient excision is made on the buccal surface to permit access with an exolever blade to the mesial surface. The exolever can be employed in the operative technic without injury to the second molar or to the ossistructure supporting the second and third molars.

A careful study should be made of every type of horizontal impaction, with special reference to the alignment of the crown of the third molar with the crown of the second. Only such ossistructure is excised as is shown by the radiogram to be necessary to permit the exolever movements to be properly made. Too much excision of the ossistructure was formerly made, and this prolonged the operation, increased the manipulation of the involved parts and aggravated the trauma usually associated with the extraction of the tooth. The procedure usually followed of cutting away with a stone or bur a part or the whole of the occlusal surface, or of cutting the tooth in two at the gingival third, has been found to be an unnecessary procedure. It is advantageous to keep the tooth intact, as the excision of the crown will cause a loss of surface to which the exolever can otherwise be applied, and, in addition, greater excision of the ossistructure will be necessary to gain access with forceps or exolever to the remaining part of the tooth. As the roots in the majority of cases of a horizontal impaction are located in cancellous structure, which will not offer great resistance, a clean fracture of the septum between them will result in most instances if the exolever movements are properly made.

Special care should be taken in the operative technic in a horizontal impaction where there is no contact of the occlusal surface of the third molar with the distobuccal surface of the second. In such a case, if there is no supporting ossistructure on the lingual surface, and the exolever is applied with undue pressure or the exolever movements are misapplied, there is a liability of the tooth being forced between the soft tissue and the ossistructure on the lingual side.

For the purpose of describing systematically the technic in the various types of horizontal impaction of the mandibular third molar, the following classification is used:

1. No deflection, with the mesial surface accessible
2. No deflection, with the mesial surface inaccessible
3. Buccal deflection, with the mesial surface accessible
4. Buccal deflection, with the mesial surface inaccessible
5. Lingual deflection, with the mesial surface accessible
6. Lingual deflection, with the mesial surface inaccessible
7. Buccolingual deflection, with the mesial surface accessible
8. Buccolingual deflection, with the mesial surface inaccessible
9. Torsional deflection, with the surface that would normally be the mesial surface accessible
10. Torsional deflection, with the surface that would normally be the mesial surface inaccessible
11. Isolated position, with the mesial surface accessible
12. Isolated position, with the mesial surface inaccessible

NO DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

An impacted mandibular third molar in a horizontal position, with the buccal and lingual surfaces in alignment with the corresponding surfaces of the second, and the mesial surface accessible to the application of the exolever, is frequently seen in practice. Practically no trauma should accompany the execution of the operative technic in such case. A correct interpretation of the radiogram will indicate that access to the mesial surface can be obtained without excision on the buccal or mesial surface. As the mesial surface is accessible to the various sizes of exolever blades, the operator uses such sizes as are indicated by the space shown in the radiogram between the mesial surface and the ossistructure below this surface.

This type of case should not, however, be confused with the horizontal impaction where the superior border of the ossistructure on the buccal surface will interfere with the application of the exolever to the mesial surface of the third molar.

CLINICAL EXAMINATION

Exposed Crown.—Parts of the occlusal and distal surfaces are usually exposed. Where the crown of the third molar is not in contact with the second, the lingual radiogram will not show the possibility of the buccal surface being deflected out of alignment buccally with the buccal surface of the second molar. In such a case the operator determines in the clinical examination the alignment of the buccal surface of the third molar with the corresponding surface of the second. In the majority of cases, however, the examination will show that there is no deflection, and that the buccal surface of the third molar is in alignment with the corresponding surface of the second. Where there is a buccal deflection, the case is treated like that described for a horizontal impaction, with a buccal deflection where the mesial surface is accessible (page 655).

Gum Tissue.—The gum tissue on the distal surface usually extends beyond the gingival third. The gum tissue on the buccal surface extends to various distances and often as far up as the distal surface, but does not, as a rule, extend over the entire occlusal surface.

RADIOGRAPHIC INTERPRETATION

Crown.—The enamel cap and pulp chamber are definitely outlined, and no part of the occlusal surface is visible. There is no overlap of the occlusal surface of the third molar upon the distal surface of the second. The occlusal surface of the third molar is not, as a rule, in contact with the distal surface of the second, but, in case there

is a contact, it will be very slight. There is usually a space between the occlusal surface of the third molar and the distal surface of the second, and food will readily lodge in this space and decompose, usually infecting the ossistructure below the mesial surface. The distal surface of the third molar may be in alignment with the occlusal surface of the second, or it may be higher or lower than this surface. The mesial surface of the third molar is usually in alignment with the gingival third of the second molar or slightly below it.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root inclined mesially, 7; mesial root straight and distal root inclined mesially, 4; fused roots, 4; both roots straight, 3; both roots inclined mesially, 3; partially developed roots, 3, and mesial root inclined distally and distal root straight, 2.

Ossistructure.—The ossistructure does not present any interference with the access of the exolever to the mesial surface from the buccal. It is not unusual, however, to find a pathologic condition anterior to and below the mesial surface. The ossistructure on the distal surface usually extends only up to the gingival third, and in many cases not so far, indicating that no excision will be necessary in that region, except in those cases where the root formation is unfavorable for the execution of the exolever movements, when excision will be necessary in order to decrease resistance.

OPERATIVE TECHNIC

Gum Tissue Technic.—The incision of the gum tissue is made, as a rule, in line with the buccal surface of the third molar, and should extend distally from the exposed part of the buccal surface of the crown as far as it may be necessary to excise the ossistructure on the distal surface. A second incision is made at the distobuccal surface of the second molar where the mesial surface of the third molar is some distance from the gingival third of the second molar, and where the gum tissue protecting the latter tooth is liable to be injured. The latter incision is made, when indicated, downward slightly anterior to the distal surface of the second molar, in line with the occlusal surface of the third molar, in order that the gum tissue on the buccal surface of the second molar will not be displaced when the application of the exolever is made to the buccal surface of the third.

Where the clinical examination shows that the gum tissue will not interfere with a mesial application of the exolever, an incision made distally over the center of the distal surface is all that is necessary

(Fig. 645 A). Where the tissue on the buccal surface is liable to be injured, the incision is made distally along this surface (Fig. 645 B); where the gum tissue is present between the occlusal surface and the distal surface of the second molar, the incision is made downward and buccally in alignment with the occlusal surface and distally along the buccal surface (Fig. 645 C), and where the gum tissue does not

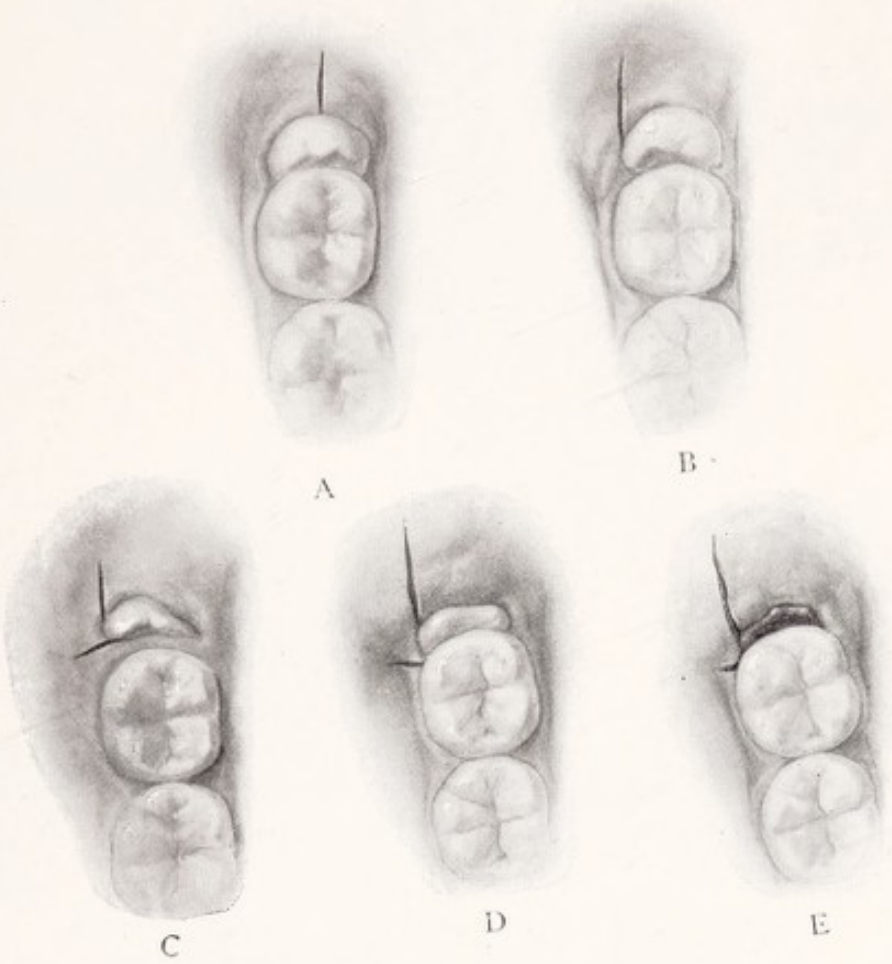


Fig. 645. — Incision of Gum Tissue—Horizontal Impaction—No Deflection —Mesial Surface Accessible. *A*, incision distally over center of distal surface; *B*, incision distally along buccal surface; *C*, incision distally along buccal surface, downward and buccally in alignment with occlusal surface; *D*, incision distally along buccal surface, downward and buccally at distobuccal surface of second molar; *E*, gum tissue returned to its original position after tooth has been extracted.

extend over the entire buccal surface and the tissue on the distobuccal surface of the second molar will be injured, the incision is made distally along the buccal surface and downward and buccally on the distobuccal surface of the second molar (Fig. 645 D). After the extraction of the third molar the flap should be returned to its original position, as shown in Fig. 645 E. Where no part of the crown is exposed the incision is made as described on page 638.

Ossistructure Technic—Distal Excision.—No excision of the ossistructure is indicated to gain access to the mesial surface from the buccal. Excision is made on the distal surface to decrease resistance

at this point, when indicated, on account of the root formation. The excision is made with ossisector No. 2L or 4L for the left side or No. 2R or 4R for the right side, and the gum tissue on the distal surface is displaced with the back of the blade (Fig. 646). As a rule, the ossistructure is not very heavy and is readily excised. The appli-

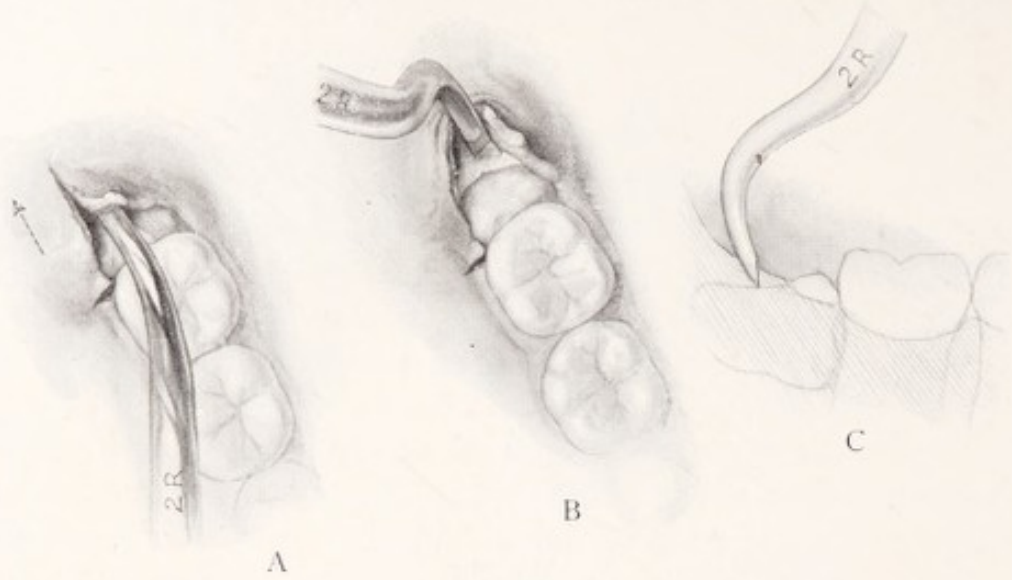


Fig. 646. — Distal Excision of Ossistructure—Horizontal Impaction—No Deflection. *A*, gum tissue displaced with back of blade of ossisector No. 2R; *B*, back of blade displacing gum tissue, and excision made toward distal surface; *C*, buccal view, showing blade applied for direct excision toward distal surface.

cation of the blade is made to that part of the distal surface that is free of ossistructure and is then directed distally and wedged between the distal surface and the ossistructure over this surface (Fig. 647). The ossistructure is often so thin that the wedging of the blade between the distal surface and the ossistructure fractures away the

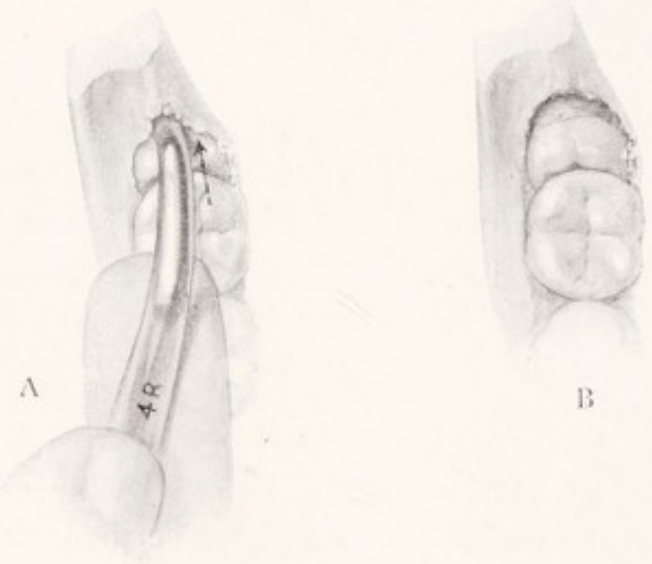


Fig. 647. — Distal Excision of Ossistructure—Horizontal Impaction—No Deflection—Mesial Surface Accessible. *A*, ossisector No. 4R applied on distal surface to fracture away thin layer of ossistructure over distal surface; *B*, condition after foregoing procedure has been executed.

thin ledge over the tooth. Where further excision is indicated the blade is directed, with pressure under control, slightly distal to the part to be excised, the ossistructure being excised at this point as illustrated for a horizontal impaction where there is no deflection and the mesial surface is inaccessible (Figs. 659, 660, pages 638, 639). The part of the ossistructure fractured away or excised should be removed before the exolever technic is executed.

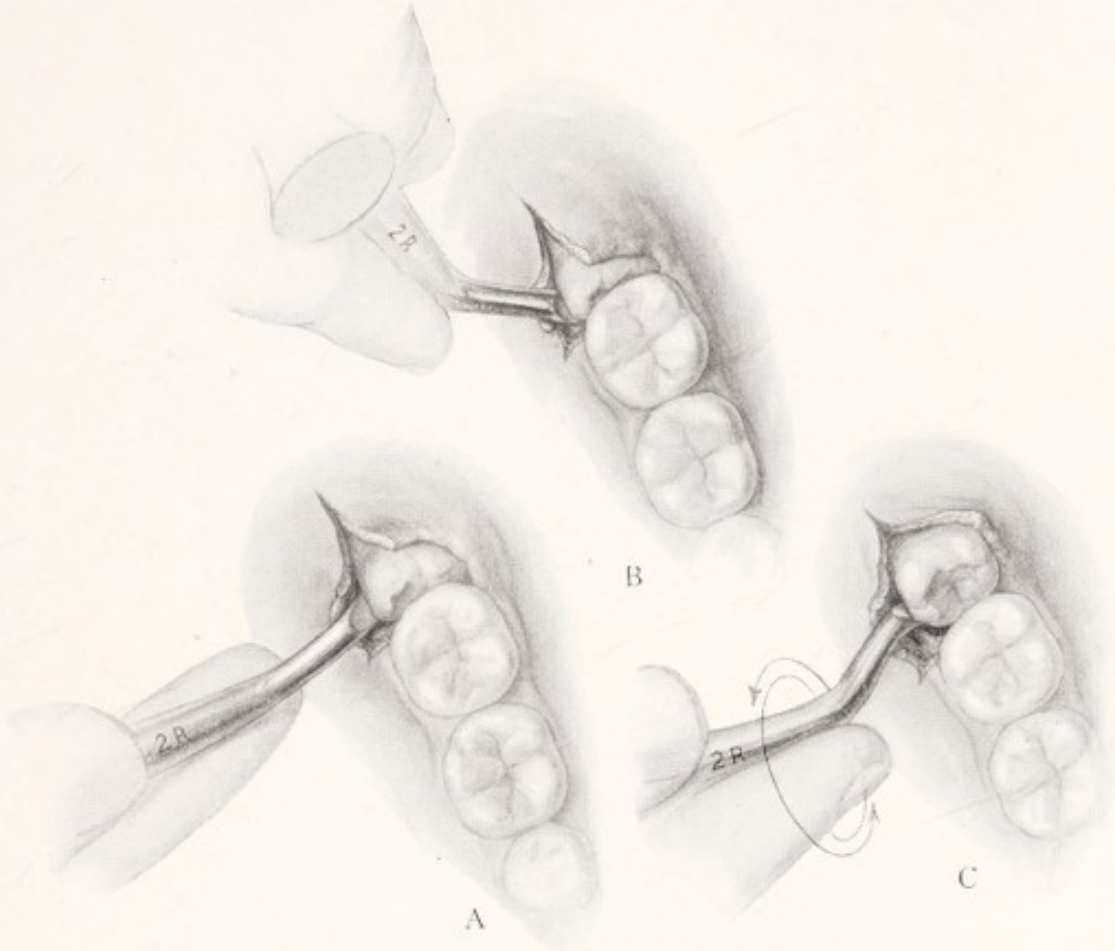


Fig. 648. — Displacing Gum Tissue—Horizontal Impaction—No Deflection —Mesial Surface Accessible. *A*, exolever No. 2R applied to buccal surface, with back of blade used to displace gum tissue; *B*, handle directed buccally, blade applied below mesial surface; *C*, handle turned mesially or distally after crown has cleared distal surface of second molar, and tooth directed upward and distally.

Exolever Technic—Mesial Application.—A careful study of the radiogram is made to determine the size of the space that may exist between the mesial surface of the third molar and the ossistructure below this surface, and between the occlusal surface and the distal surface of the second molar.

In Fig. 487, page 469, are shown spaces of various degrees, also exolever blades used in a mesioangular impaction where there is no deflection and the mesial surface is accessible. The same principle applies for determining the size of space present and the selection of the exolever blade in this type of impaction. The character of

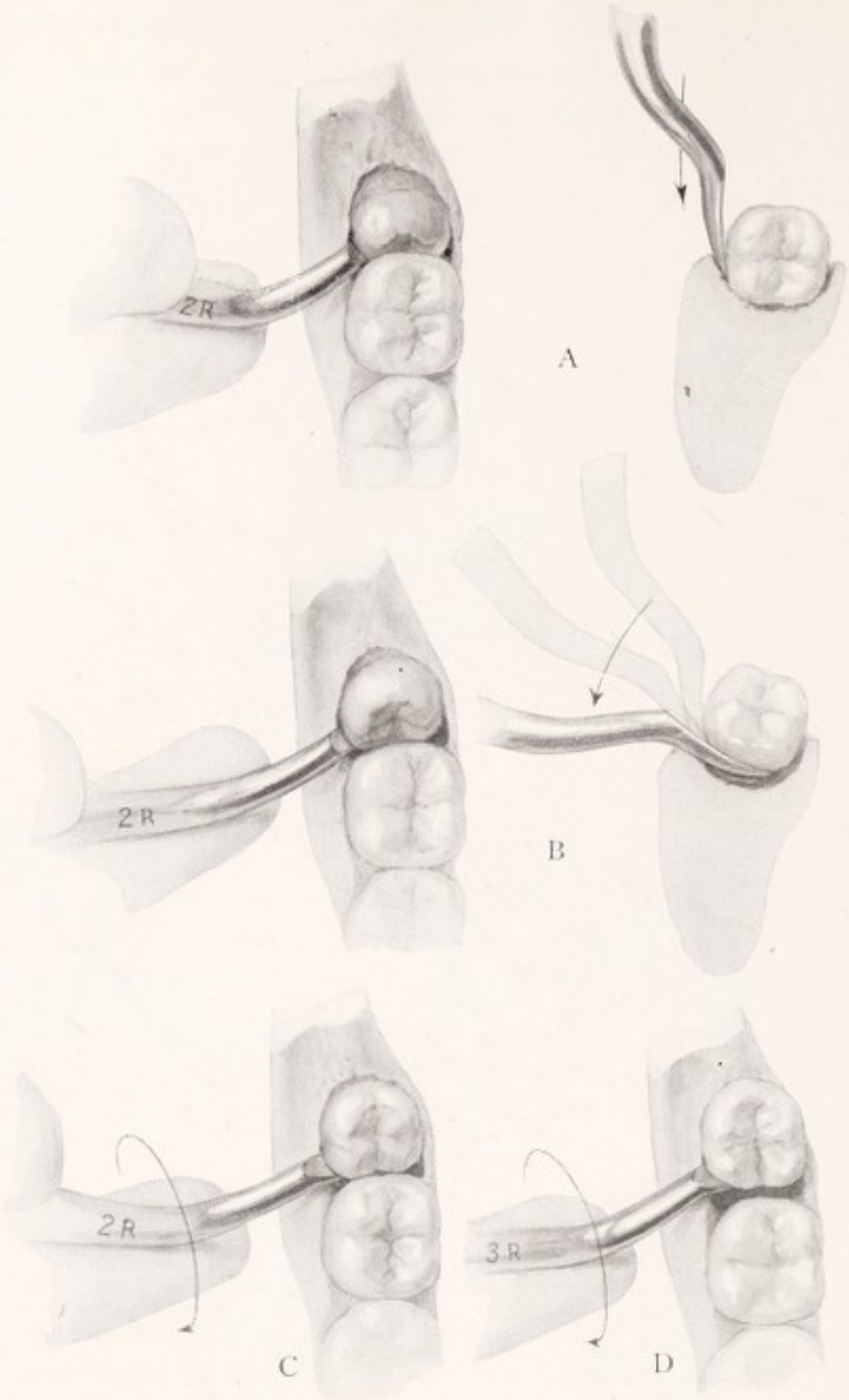


Fig. 649. — Mesial Application of Exolever—Horizontal Impaction—No Deflection—Mesial Surface Accessible. *A*, exolever No. 2R applied to buccal surface, occlusal and frontal views; *B*, handle directed buccally, blade wedged between mesial surface and ossistructure, and tooth directed partially upward, occlusal and frontal views; *C*, handle turned mesially to direct tooth upward and distally; *D*, exolever No. 3R directing tooth upward and distally by turning handle mesially.

the space having been determined, an exolever with a blade of appropriate size is applied under the mesial surface, and, by successive applications of exolevers with larger blades, when indicated, the tooth is extracted by directing it upward and distally out of its socket. Exolever No. 2L, 2R; No. 3L, 3R; No. 4L, 4R; No. 5L, 5R;

or No. 7L, 7R is selected. The gum tissue on the buccal surface is displaced with the back of the blade (Fig. 648), and the blade, with the flat side applied to the buccal surface, is sent down on this surface (Fig. 649 A), when it is adjusted below the mesial surface by directing the handle buccally (Fig. 649 B), the ossistructure along the buccal surface being used as a fulcrum, which adjustment will often create a wedge and partially raise the tooth, and in some cases the tooth may be extracted. Where it is not extracted by this procedure the handle of the exolever is then turned mesially (Fig.

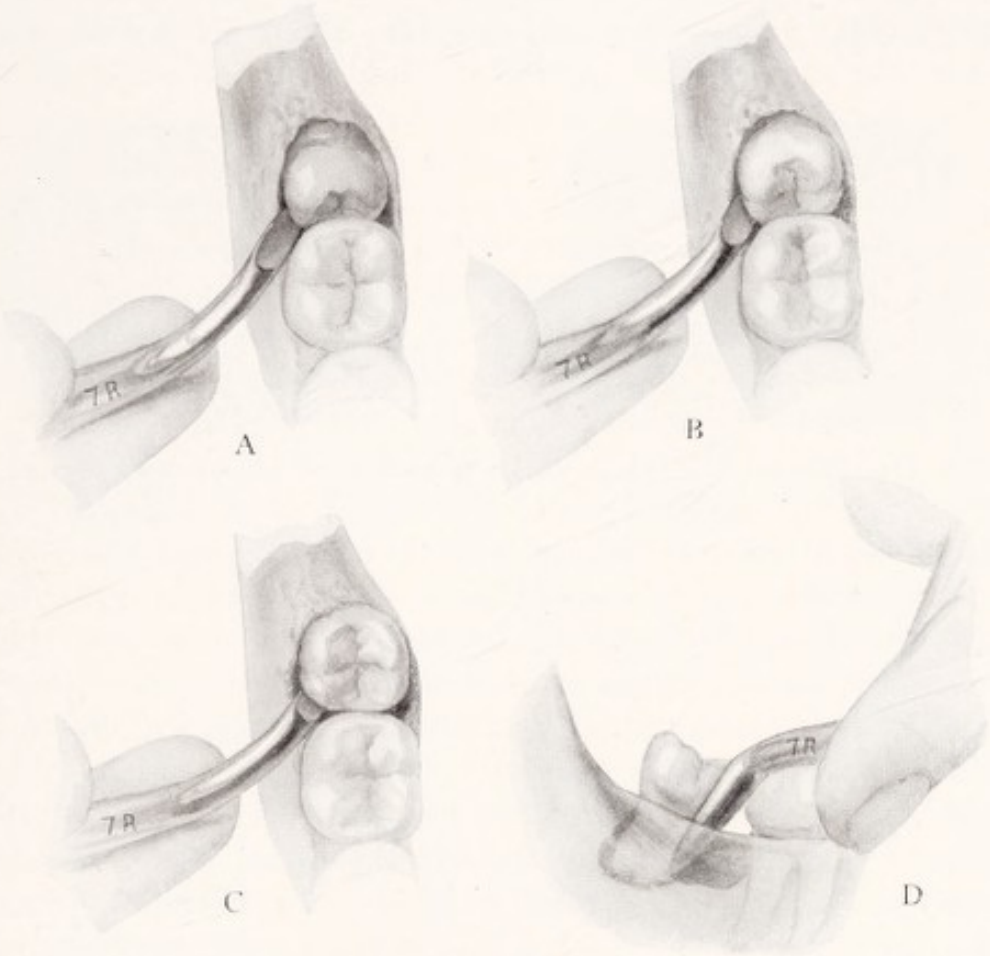


Fig. 650. — Mesiobuccal Application of Exolever—Horizontal Impaction—No Deflection—Mesial Surface Accessible. *A*, exolever No. 7R applied to mesiobuccal surface; *B*, blade wedged between mesiobuccal surface and ossistructure along this surface; *C*, tooth forced upward by directing handle downward or upward; *D*, tooth directed upward and distally out of its socket by directing handle distally.

649 C), a movement which will raise the tooth farther out of its socket until the fulcrum is lost, when an exolever with a larger blade is applied (Fig. 649 D), and the handle of the instrument is again turned mesially to complete the extraction, if the root formation indicates such a procedure. Where the ossistructure below the crown has been involved by a pathologic condition, it is not so efficient a fulcrum as when the structure is in a normal condition. The extraction, where possible, is completed with the initial application

of the exolever, as repeated applications of the instrument will have a tendency to break down the fulcrum further. Where there is quite a large septum between the roots, sufficient force is applied on the first application of the exolever to fracture the septum in order that part of the lingual plate may not be fractured when the tooth is being directed upward and distally out of its socket.

Mesiobuccal Application.—Where the third molar has been directed slightly upward and distally, or where the ossistructure below the mesial surface, on account of a pathologic involvement, is not a suitable fulcrum, the ossistructure along the mesiobuccal surface is then utilized for that purpose and exolever No. 7L or 7R is indicated and applied to the mesiobuccal surface in alignment with the latter surface (Fig. 650 A). The blade is then directed distally along the mesiobuccal surface (Fig. 650 B). When the instrument is being adjusted, a wedge is usually created which assists in loosening or extracting the tooth. If the tooth is not extracted by this procedure, the handle is then pressed downward or directed upward in order to force the tooth upward to clear the distal surface of the second molar (Fig. 650 C), after which the tooth is directed farther upward and distally out of its socket by directing the handle distally (Fig. 650 D).

Where the third molar has been directed upward and distally by the application of the exolever to the mesial or mesiobuccal surface and raised to a point where it is in a mesioangular position, the second molar can often be used to improve the fulcrum, provided the latter tooth is suitable for that purpose. Where, however, the root formation is of such a character that a fracture may result, after the tooth has been directed upward and distally, a buccal application can be made to complete the extraction.

Buccal Application.—Where both roots are straight or divergent, the mesial root is inclined distally and the distal root is straight—the latter root not being large but liable to be fractured when the tooth is directed too far upward and distally—the progress of the extraction movements when executed with the exolever adjusted to the mesial or mesiobuccal surface is discontinued as soon as the tooth is clear of the distal surface of the second molar and is in a mesioangular position. Exolever No. 10L or 10R is indicated, and the gum tissue over the buccal surface is displaced with the back of the blade. The blade is then directed toward the bifurcation and wedged between the buccal surface and the ossistructure, when the handle is turned buccally and the tooth is directed out of its socket, as illustrated for a mesioangular impaction (Fig. 490, page 472). No attempt should be made to execute the foregoing technic when the crown of the second molar will interfere with the progress of the tooth anteriorly.

SUMMARY OF CASES

Where both roots are inclined distally, the operator directs the exolever movements upward and distally, following the direction of the root formation, which is unusual in this type of impaction. Where the mesial root is inclined distally and the distal root is straight, the exolever movements are directed upward and distally to produce a clean fracture of the septum between them. The distal root will not fracture, as it is usually strong enough to withstand the strain that may be applied. The initial application is made deliberately, as the pathologic condition below the mesial surface is usually extensive, and repeated applications of the exolever should be avoided.

Fig. 651. — Horizontal Impaction—No Deflection—Mesial Surface Accessible. Roots fused, with ossistructure on distal surface extending to gingival third, and greater part of lingual and buccal surfaces free of ossistructure.

In the cases shown in Fig. 651, where the roots are fused, no excision of the ossistructure is indicated. An exolever blade of a size that can be wedged between the mesial surface and the ossistructure below this surface will usually dislodge the tooth. If, however, such a procedure does not extract the tooth, the blade is sent farther in between the mesial surface and the ossistructure, and the handle of the exolever is turned mesially to extract the tooth. Where the roots are fused and large, there will be greater resistance, and correspondingly greater force is applied when the tooth is directed upward and distally out of its socket.

In the cases shown in Fig. 652, where the mesial root is inclined distally and the distal root is inclined mesially, a slight excision of the ossistructure on the distal surface is indicated, as the formation of the roots and the septum between them will be quite a resisting factor. The first application of the exolever to direct the tooth upward and distally is, therefore, executed with considerable pressure to produce a clean fracture of the septum between the roots, and repeated applications of the instrument should be avoided, if possible, to obtain this result. If a proper degree of force is not applied the septum will not fracture, and each succeeding application of the exolever, the blade resting upon the ossistructure, will break down

this structure if it is affected by a pathologic condition. Subsequent applications to direct the tooth upward and distally and fracture the septum will be more complicated on account of the lack of a suitable fulcrum, and for this reason the initial application should be final.

Fig. 652. — Horizontal Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially, with a small septum between roots. The ossistructure on distal surface extends to gingival third, and part of lingual and buccal surfaces free of ossistructure.

In the cases shown in Fig. 653, where the mesial root is inclined distally and the distal root is inclined mesially, with both roots large, excision of the ossistructure on the distal surface is made to decrease resistance at this point. The exolever technic is the same as described for the cases shown in Fig. 652, the operator selecting a blade of a size that will fit into the space between the mesial surface of the third molar and the ossistructure below this surface, but avoiding breaking down further the extensively involved ossistructure, and making, if possible, the initial application of the exolever the final movement.

In the cases shown in Fig. 654, where the mesial root is straight and the distal root is inclined mesially, a slight excision of the ossistructure on the distal surface is indicated, and the same exolever technic will apply as in the cases shown in Fig. 651. Occasionally the distal root may fracture, but such a fracture can be avoided by an extensive excision of the ossistructure on the distal surface. If, however, the tooth is free of ossistructure at the gingival third, a fracture of the distal root will not usually follow. In case there is

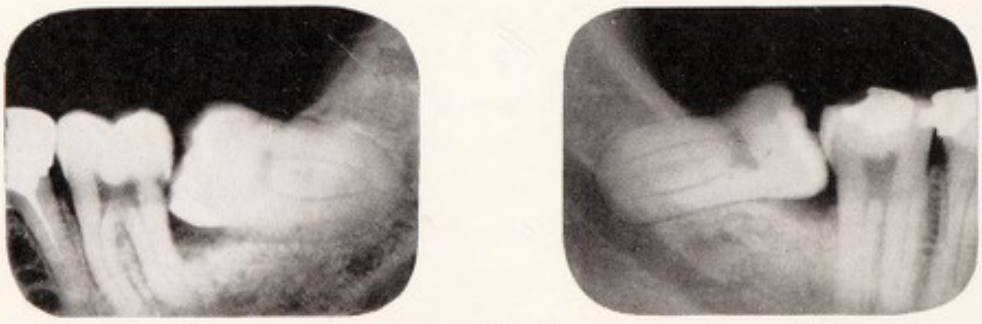


Fig. 653. — Horizontal Impaction—No Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially, roots being large. The ossistructure on distal surface extends to gingival third, with a pathologic condition below mesial surface, and greater part of lingual and buccal surfaces free of ossistructure.

a fracture of either root, the part remaining can be readily removed with an exolever. An operator not accustomed to the use of an exolever may hesitate to execute the indicated procedure, fearing a fracture of one or both roots. Such a fracture will not occur, especially where the roots are large and strong enough to withstand the resistance of the septum between them until the latter is fractured, when the exolever movements are executed. In a case of this kind, where the mesial root is not large, and where the crown has been directed to a distance where it is clear of the distal surface of the second molar a buccal application is indicated to complete the extraction.

Fig. 654. — Horizontal Impaction—No Deflection—Mesial Surface Accessible. Mesial root straight and distal root inclined mesially, with ossistructure on distal surface extending to gingival third, and greater part of lingual and buccal surfaces free of ossistructure.

In the cases shown in Fig. 655, where there is a variation in the root formation and the crown is extremely large, considerable resistance will be encountered when the exolever technic is applied. Although the tooth is free of ossistructure on the distal surface down to the gingival third, excision is indicated at this point in order to decrease resistance. When the exolever blade is selected, it should be of a size that will fit between the mesial surface and the ossistructure below this surface. The operator should not hesitate to exert considerable pressure when applying the exolever, as there is no danger of fracturing the crown, roots or mandible when the tooth is directed upward and distally. A buccal application of the exolever at the bifurcation is made after the tooth has been directed to a point where it is clear of the distal surface of the second molar and in a mesioangular position.

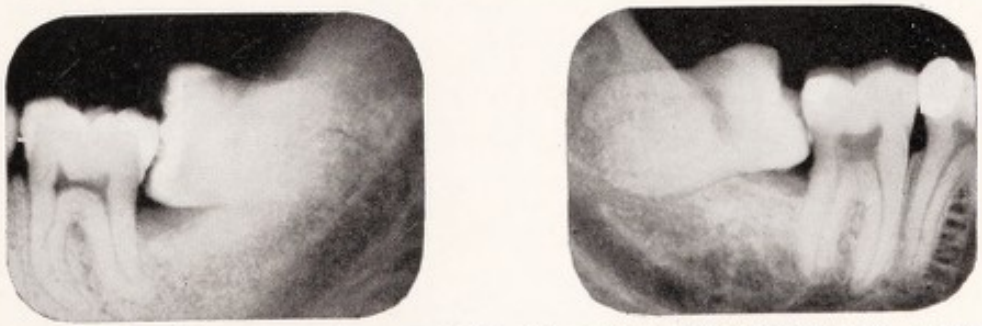


Fig. 655. — Horizontal Impaction—No Deflection—Mesial Surface Accessible. Crown and roots large. The ossistructure on distal surface extends to gingival third, with a pathologic condition below mesial surface, and lingual and buccal surfaces free of ossistructure.

In the cases shown in Fig. 656, where both roots are inclined mesially, the ossistructure on the distal surface is excised beyond the gingival third. A fracture of the roots can be avoided in these cases by the application of pressure downward upon the distal surface of the crown by adjusting the exolever to this surface to fracture the septum between the roots, which procedure is the reverse of that followed to direct the tooth upward and distally. A pathologic condition is invariably present below the mesial surface, and the tooth is directed downward by applying pressure with the exolever to the distal surface and directing the tooth as far as the space created by the pathologic involvement below the mesial surface will permit. Usually no fracture of the roots will follow this procedure, but if a fracture of either root occurs, the remaining parts can be removed as described in Chapter XXIV. After the tooth has been directed downward into the space created by the pathologic condition below the mesial surface, the exolever is then applied to the mesial surface to direct the tooth upward and distally. Where the mesial inclination of the roots is extreme, a fracture of the roots will often be avoided where there is no pathologic condition below the mesial surface by excising initially the ossistructure below the latter surface to permit the tooth to be directed downward.

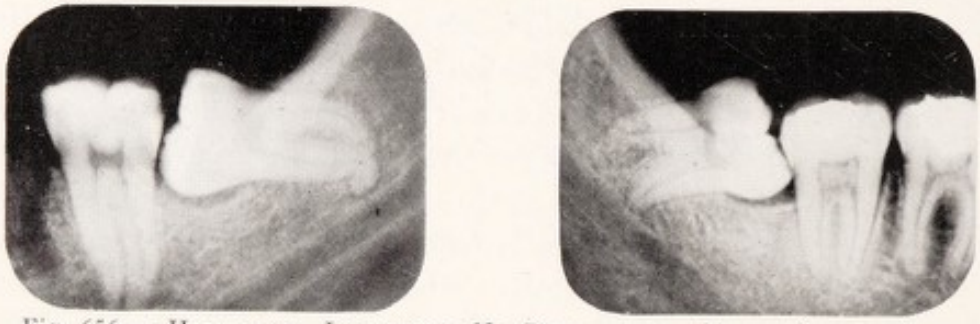


Fig. 656. — Horizontal Impaction—No Deflection—Mesial Surface Accessible. Both roots inclined mesially. The ossistructure on distal surface extends to gingival third, with a slight pathologic condition below mesial surface, and part of lingual and buccal surfaces free of ossistructure.

NO DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

A case where the third molar is impacted in a horizontal position, with the buccal surface of the crown in alignment with the corresponding surface of the second molar, and with the mesial surface below the superior border of the ossistructure, being therefore inaccessible to the immediate application of the exolever, is not so frequently seen as a case where the mesial surface is accessible to the application of the exolever. The position of the occlusal surface of the third molar in its relation to the distal surface of the second should be observed, as often there is quite a space between these teeth, and occasionally there is ossistructure between the occlusal surface of the third molar and the distal surface of the distal root of the second.

When determining the operative procedure, the amount of ossistructure supporting the distal surface of the distal root of the second molar is taken into consideration. Where there is no supporting ossistructure to protect the distal root at the apical third, any unnecessary pressure applied to the second molar may loosen this tooth. The peridental membrane at this point is often involved, and a pressure absorption of the distal root is not unusual. The condition of the second molar after the extraction of the third should be considered in advance of any operative procedure.

This type of impaction should not be confused with that type of horizontal impaction where there is no deflection and the mesial surface is accessible to the immediate application of the exolever (page 623). The difference between this case and the one to which reference is made is that in the present case the mesial surface is lower than the superior border of the ossistructure, and access to the mesial surface cannot be obtained without excision of the ossistructure. Special attention is given to the position of the mesial surface of the third molar in its relation to the superior border of the ossistructure on the buccal surface. As there is no deflection of the buccal surface of the crown of the third molar compared with the corresponding surface of the second, the operator cannot utilize for the application of the exolever that part of the mesial surface which, in a buccal deflection, is free of the distobuccal surface of the second molar, and the approach to the mesial surface is therefore made from the buccal surface.

CLINICAL EXAMINATION

Exposed Crown.—Rarely is any part of the crown exposed, but, if there is such exposure, it will be a small part of the distal surface.

Gum Tissue.—The entire tooth is usually covered by gum tissue.

RADIOGRAPHIC INTERPRETATION

Crown.—The enamel cap and pulp chamber are definitely outlined and no part of the occlusal surface is visible. There is no overlap of the occlusal surface of the third molar upon the distal surface of the second, a condition indicating that the buccal and lingual surfaces of the third molar are in alignment with the corresponding surfaces of the second.

There is usually no contact of the occlusal surface of the third molar with the distal surface of the second, but, if there is such a contact, it will be very slight. The contact point between the first and second molars is examined to determine whether there is an overlap of one tooth upon the other (Figs. 667 to 681). This check is made to verify the relation of the occlusal surface of the third molar to the distal

surface of the second. In these cases no overlap of the third molar upon the distal surface of the second is shown.

After the incision of the gum tissue a clinical examination is carefully made to verify the radiographic interpretation for the purpose of determining whether there is possibly a buccal deflection of the tooth. If there is such a deflection, it will usually be slightly buccal and will indicate the technic to be followed. When, however, the deflection is very marked, the technic for a buccal deflection where the mesial surface is inaccessible is indicated (page 662).

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root inclined mesially, 17; mesial root straight and distal root inclined mesially, 10; mesial root inclined distally and distal root straight, 8; both roots straight, 5; fused roots, 5; partially developed roots, 3; divergent roots, 2, and hypercementosed roots, 2.

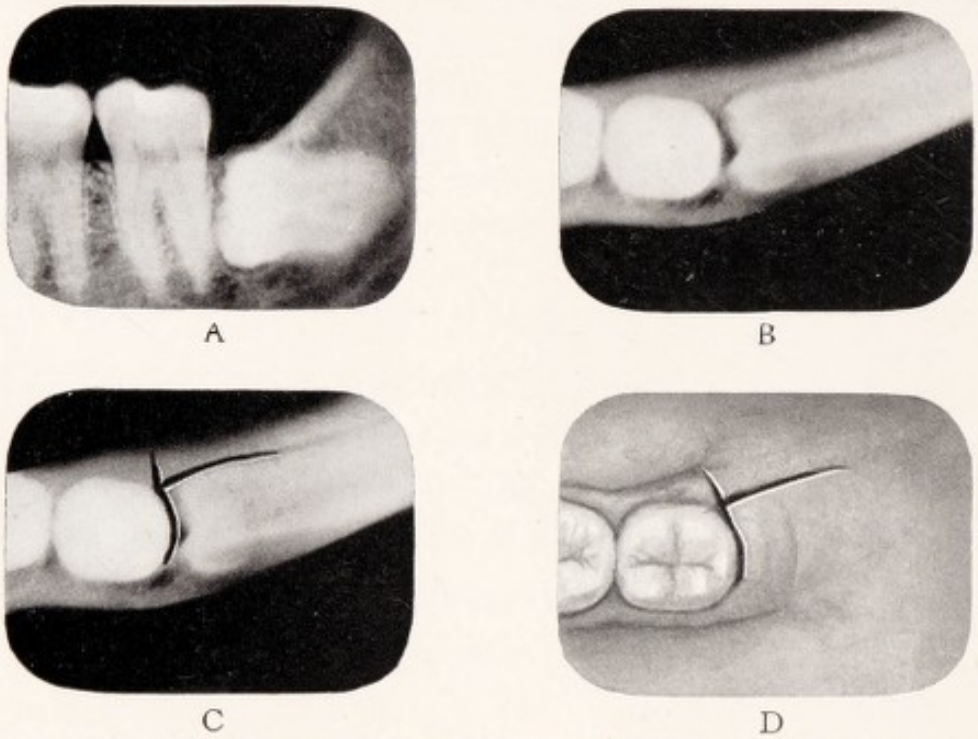


Fig. 657. — Gum Tissue Technic—Horizontal Impaction—No Deflection—Mesial Surface Inaccessible. *A*, radiogram of a no deflection; *B*, occlusal view of same case; *C*, incision made along entire distal surface of second molar, downward and buccally on distobuccal surface of second molar and distally along buccal surface; *D*, occlusal view.

Distal Root of Second Molar.—The distal surface of the distal root of the second molar is studied in the radiogram to determine to what extent that root may be involved by a pathologic condition. The ossistructure supporting the distal surface of the distal root of the second molar is often involved by pathologic changes, and the question whether the second molar will be of any service after the extraction of the third is an important point to be considered.

In the case shown in Fig. 680 B, page 653, where the entire occlusal surface of the third molar is in contact with the distal surface of the distal root of the second, it will be found, by investigation with an exploring instrument after the extraction of the impacted tooth, that the distal root of the second molar has usually been involved at the apical third by the pressure of the third molar, that the surface is not smooth, and that regeneration of the ossistructure is not favorable after the extraction of the impacted tooth. There is always a great deal of discomfort around the second molar, even in those cases where the occlusal surface of the third molar or the instrument of extraction has not come in contact with the distal root of the second molar during the extraction of the tooth.

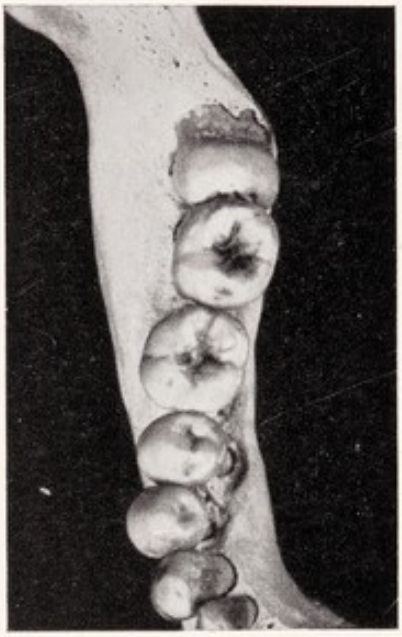


Fig. 658. — Ossistructure on Distal Surface—Horizontal Impaction—No Deflection—Mesial Surface Inaccessible. Mandible showing jagged ossistructure at distal of impacted third molar, which should be fractured or excised so as not to leave sharp irritant surfaces.

Ossistructure.—There is a variation in the location of the ossistructure on the distal surface, where the structure often extends beyond the gingival third or over this entire surface. The amount of ossistructure on the buccal surface of the third molar varies, depending on the extent of the depression of the tooth below the superior border of the ossistructure. An examination is made to determine the amount of excision of the ossistructure on the buccal surface of the third molar that may be necessary to gain access with the exolever below the mesial surface. Pathologic changes do not often involve the ossistructure, but the structure below the mesial surface and at the gingival third of the second molar is occasionally affected by a pathologic condition, but no dependence can be placed on radiographic interpretation

with a view to obviating excision on the buccal surface in order to apply the exolever to the mesial surface. The ossistructure on the buccal surface will interfere with the application of the exolever to the mesial surface, and excision for access is usually indicated. Where there is no pathologic involvement of the ossistructure in the region of the mesial surface, the structure will make an ideal fulcrum.

In extremely rare cases there may be ossistructure between the occlusal surface of the third molar and the distal surface of the distal root of the second, which structure will be an interfering factor, and is excised before an exolever is applied to the mesial surface to direct the tooth upward and distally out of its socket. The amount of ossi-

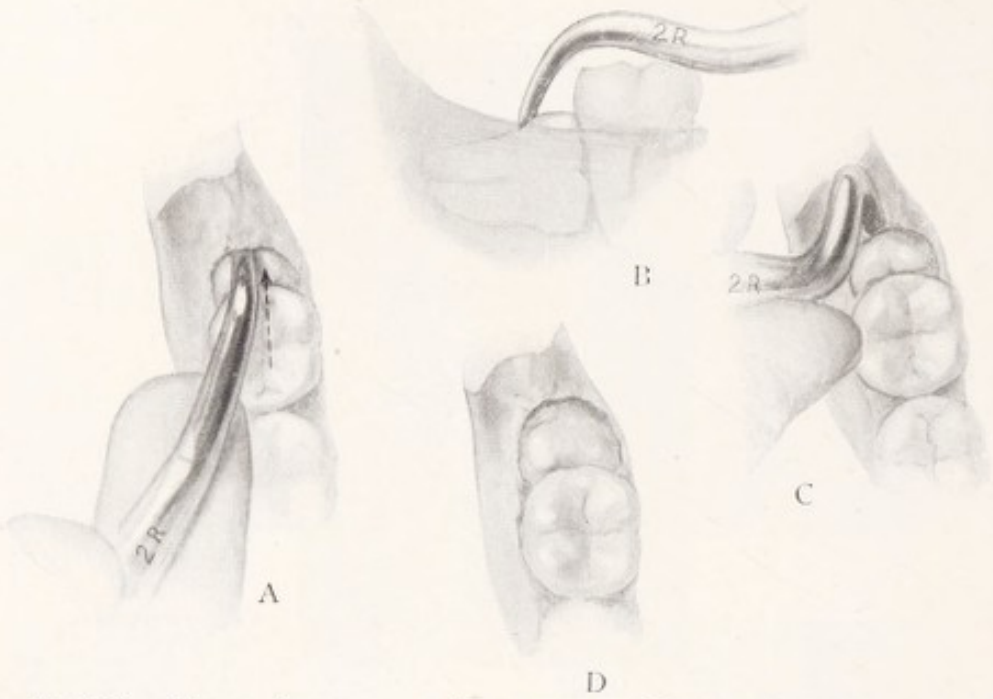


Fig. 659. — Distal Excision of Ossistructure—Horizontal Impaction—No Deflection. *A*, ossisector No. 2R applied to center of ossistructure on distal surface on right side, viewed from occlusal; *B*, same application, viewed from buccal; *C*, blade directed distally for excision; *D*, extent of excision.

structure between the two teeth will vary in different cases, and in most instances the greater part of the distal root of the second molar is exposed after the impacted tooth is extracted.

OPERATIVE TECHNIC

Gum Tissue Technic.—An incision of the gum tissue is made on the buccal surface of the second molar a short distance anterior to the distal surface, and the lancet is directed downward in conformity with the distance that the mesial surface extends below the superior border of the ossistructure. A second incision is made along the buccal surface, extending distally far enough from the upper point of the first incision to permit excision of the ossistructure on the buccal and distal

surfaces in order to apply the exolever to the mesial and buccal surfaces. A third incision is made along the entire distal surface of the second molar. In Fig. 657 is shown lingual and occlusal radiograms of a case where the incision has been determined from the radiographic interpretation.

Ossistructure Technic—Distal Excision.—As a general rule, the ossistructure does not extend on the distal surface very far beyond the gingival third, except where the structure extends over the entire tooth. Excision on the distal surface will decrease resistance at this point when the exolever is applied to the mesial surface, especially where both roots are straight or divergent, and decreasing the resist-

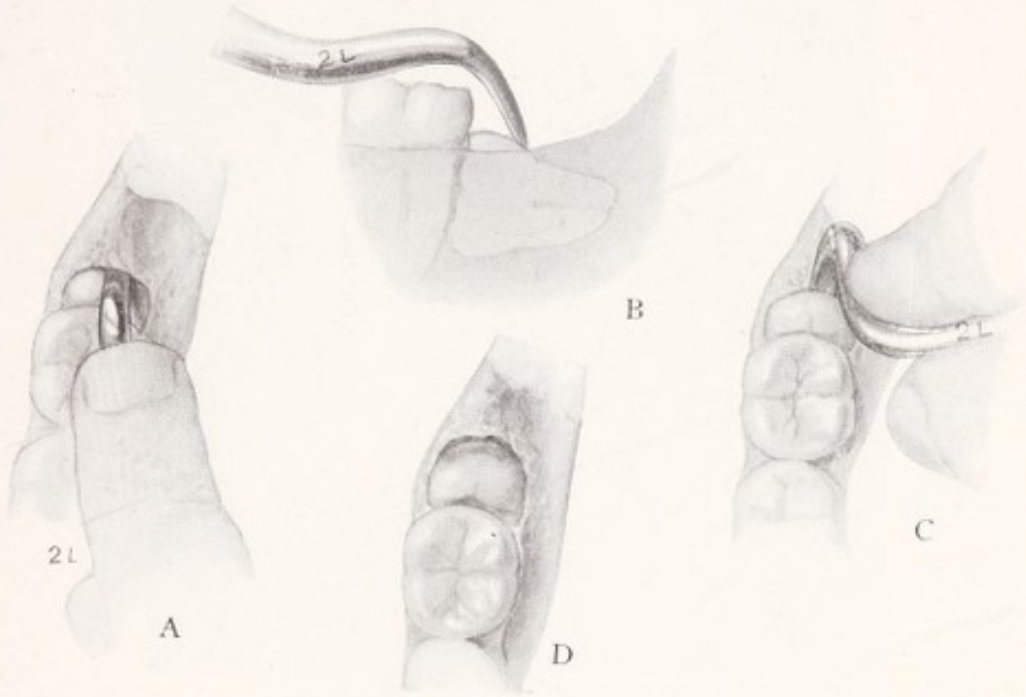


Fig. 660. — Distal Excision of Ossistructure—Horizontal Impaction—No Deflection. *A*, ossisector No. 2L applied to center of ossistructure on distal surface on left side, viewed from occlusal; *B*, same application, viewed from buccal; *C*, blade directed distally for excision; *D*, extent of excision.

ance on the distal surface may obviate a fracture of the roots. Excision is made with ossisector No. 2L, 2R; No. 4L, 4R; or No. 5L, 5R. Where only a slight excision is indicated, ossisector No. 2L or 2R is used. Where there is a broad distal surface, and in those cases where extensive excision is indicated, the ossisector designated above is used to start the excision, ossisector No. 4L or 4R being used to continue the excision. The gum tissue on the distal surface is displaced with the back of the blade (Fig. 646, page 626), and the blade is directed, with pressure under control, toward the ossistructure, which is excised, when the blade is directed farther distally until sufficient structure has been excised to decrease resistance at this point. It will not be difficult to excise the ossistructure, provided the excision is confined to the

structure on the distal surface and is not extended buccally or lingually to this surface, which excision is unnecessary. Where, however, the ossistructure extends over the entire distal surface, excision will not be so readily made, and ossisector No. 5L for the left side or No. 5R for the right side is selected for the initial excision in order to penetrate through the ossistructure, after which the necessary excision is made with the ossisectors designated above.

Where the structure over the distal surface does not extend to the gingival third, as a rule, it is not very heavy and can be fractured

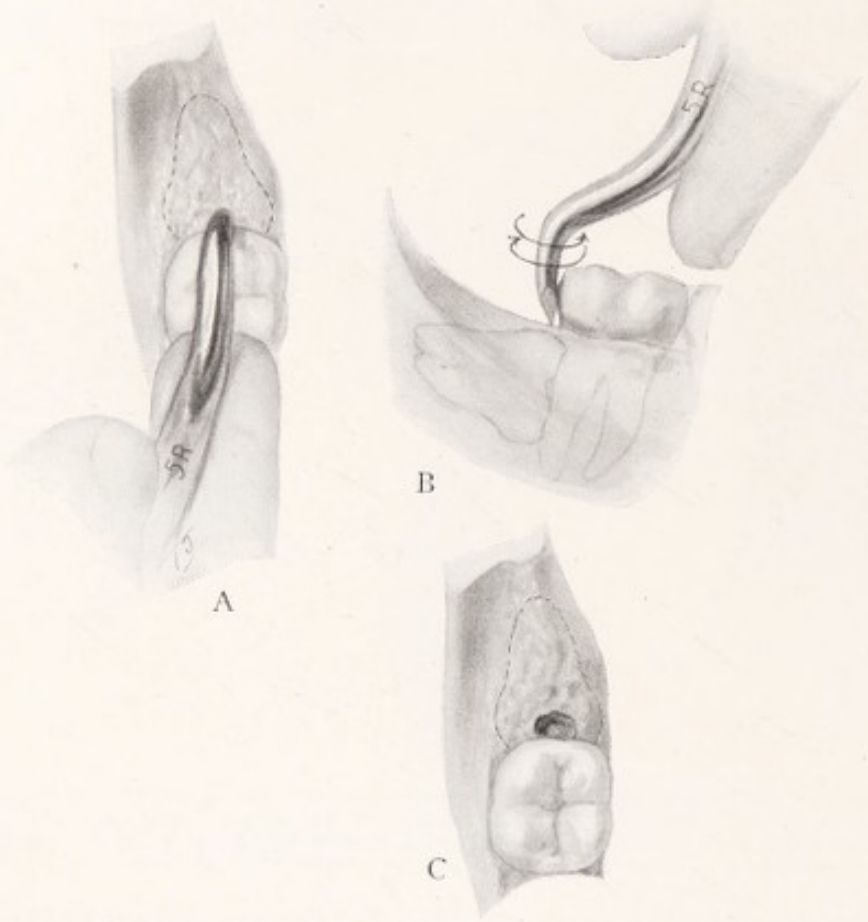


Fig. 661. — Distal Excision of Ossistructure—Horizontal Impaction—No Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 5R applied to ossistructure to penetrate initially structure where it extends over entire distal surface, viewed from occlusal; *B*, viewed buccally; *C*, structure penetrated.

away over the surface with ossisector No. 4L or 4R, as illustrated in Fig. 647, page 626. This should be a routine procedure where the ossistructure does not extend beyond the gingival third, as a sharp surface often remains after extraction, and a case of this character is illustrated in Fig. 658.

Where the ossistructure extends to or beyond the gingival third and is not over the entire distal surface, the excision is made with ossisector No. 2L or 2R, and the blade is directed toward the center of the ossistructure over the distal surface (Figs. 659 A and 659 B), and is wedged

between the ossistructure and the distal surface, which procedure is often practicable and assists in decreasing the resistance of subsequent excisions. When the blade cannot be wedged between the ossistructure and the distal surface, or where further excision is indicated after the structure has been fractured from the distal surface, the blade is then directed slightly distal to the part to be excised (Fig. 659 C) and, with pressure under control, excision is continued until sufficient structure has been excised to permit the exolever movements to be executed (Fig. 659 D).

In Fig. 660 is shown the foregoing technic applied on the left side.

Fig. 662. — Mandible Showing Space Between Ossistructure and Buccal Surface—Horizontal Impaction—No Deflection. In the mandibles the spaces that may be present between buccal surface and ossistructure on that surface are shown, and often obviate excision on buccal surface to gain access with exolever to mesial surface.

Where the ossistructure extends over the entire distal surface the initial excision is made with ossisector No. 5L or 5R by appyling the sharp point to the superior border of the ossistructure (Fig. 661), and turning the blade to the right and left until sufficient opening has been made to continue the excision with ossisector No. 2L or 4L for the left side or No. 2R or 4R for the right side.

Buccal Excision.—Where the ossistructure on the buccal surface interferes with the adjustment of the exolever to the mesial surface, excision is indicated on this surface from the superior border downward to a point where the exolever can be adjusted to the mesial surface. Excision is made on the buccal surface in such a manner that the superior border is slightly above the mesial surface, but should

not interfere with access to this surface. In some cases, when excising on the buccal surface to gain access to the mesial surface, it will be found that, when excision is made with a small blade along the buccal surface toward the mesial, it will not be so difficult to excise the ossistructure as may be supposed. There may be a space between the buccal surface and the ossistructure on this surface to permit a free application of an ossisector blade to the mesial surface (Fig. 662). Where the mesial surface is not very far from the superior border of the ossistructure, ossisector No. 6L for the left side or No. 6R for the right side is indicated. This instrument will serve the purpose of a pathfinder for locating space which is so often present between the buccal surface and the ossistructure on this surface, but should not

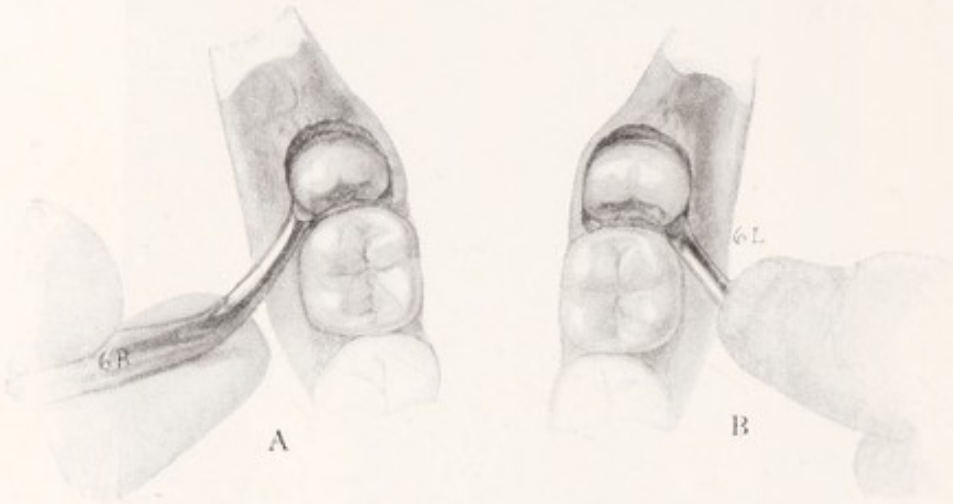


Fig. 663. — Buccal Excision of Ossistructure—Horizontal Impaction—No Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 6R applied in alignment with buccal surface for excision of ossistructure on right side where structure does not extend very far up on this surface or there is a space present; *B*, application made on left side.

be used for extensive excision where the mesial surface is located quite a distance from the superior border.

The initial adjustment of the ossisector for excision of the ossistructure on the buccal surface where the structure does not extend up to the distal surface is made to that part of the buccal surface that is free of ossistructure. The blade is applied to this part of the buccal surface, and the gum tissue over the buccal surface is displaced with the back of the blade. The blade, adjusted in a vertical position and in alignment with the buccal surface, is sent downward with a slight degree of pressure, so that the edge of the blade will be forced between the buccal surface and the ossistructure on this surface (Fig. 663). It is not unusual, as mentioned above, to find a space that will permit the blade to enter between the buccal surface and the ossistructure on this surface, and in an occasional case the blade may be directed as far as the mesial surface. If the blade encounters a slight resistance,

more pressure is exerted until the mesial surface has been reached. The wedge created with the ossisector blade between the ossistructure and the buccal surface, where the roots are not large, is often sufficient to loosen or extract the tooth.

Where there is a space between the buccal surface and the ossistructure on this surface, permitting the blade of the ossisector to be directed as far as the mesial surface, and where the ossistructure extends quite a distance up on the buccal surface so that it will interfere with the use of the superior border of the ossistructure as a fulcrum, excision is made downward on the buccal surface to a point where there will be no interference with the use of the ossistructure on the buccal surface as a fulcrum.

Where the mesial surface is located quite a distance from the superior border of the ossistructure, and where space does not exist, ossisector No. 11L for the left side or 11R for the right side is indicated. The blade is applied to the superior border of the ossistructure where the structure extends over the entire buccal surface or to that part of the buccal surface which is free of ossistructure (Figs. 664 and 665). The blade of the ossisector is then directed at right angle to the buccal surface, and excision is made from the superior border of the ossistructure to a point that will allow the application of the exolever to the mesial surface. It is not necessary to excise on the buccal surface all the way to the mesial surface, and only sufficient excision is made to reach under the mesial surface with the ossisector and exolever, as much ossistructure as possible being retained on the buccal surface to be utilized as a fulcrum.

Occlusal Excision.—Where there is ossistructure between the occlusal surface of the third molar and the distal surface of the second, excision is made with ossisector No. 8L or 11L for the left side or No. 8R or 11R for the right side. The gum tissue over the occlusal surface of the third molar and between this surface and the distal surface of the second is displaced, when the blade is directed downward with pressure between these teeth in order to excise the ossistructure over the occlusal surface (Fig. 666). A direct excision cannot be made on account of the limited space, and care should be taken when the blade is directed between the two teeth to avoid injury to the distal surface of the distal root of the second molar.

Exolever Technic—Mesial Application.—When excision of the ossistructure is indicated and has been made on the occlusal, distal and buccal surfaces, exolever No. 2L for the left side or No. 2R for the right side is selected. The flat side of the blade is applied to the buccal surface and, with the round side, the gum tissue is displaced, when the exolever, held in a vertical position, is sent down on the buccal surface.

When the blade has entered the space between the buccal surface of the tooth and the ossistructure, and the point has reached the mesial surface, the handle of the exolever is directed buccally to apply the blade below the mesial surface. The flat side of the blade engages the mesial surface and the round side rests upon the ossistructure below and buccal to the tooth. The handle is then pressed downward, and the tooth is directed upward and distally, which procedure will raise the tooth to a position where the mesial surface is in alignment with or above the superior border of the ossistructure. The exolever employed, when indicated, is exchanged for exolever No. 3L, 3R; 4L, 4R; or No. 5L, 5R, of a size that will enter the space created below the mesial sur-

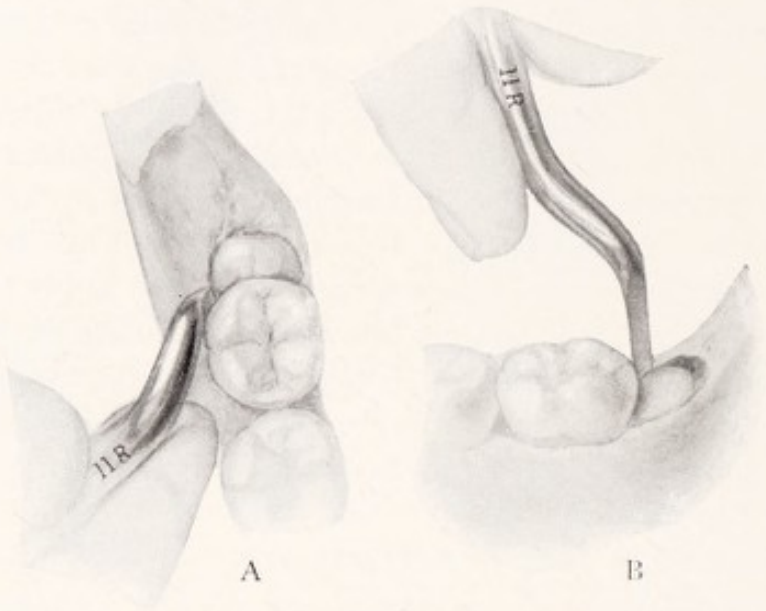


Fig. 664. — Buccal Excision of Ossistructure—Horizontal Impaction—No Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 11R applied to exposed part of buccal surface, viewed from occlusal; *B*, application, viewed buccally.

face and the superior border of the ossistructure, when the exolever is applied, the flat side of the blade engaging the mesial surface and the round side resting upon the superior border. When the blade has been adjusted, the handle of the exolever is directed mesially, with pressure under control, and this movement will force the tooth upward and distally. If the fulcrum is lost, an exolever of the same design with a larger blade is applied, and the exolever movement is repeated until the tooth is extracted.

Where the ossistructure below the mesial surface is extensively involved by pathologic changes, or there has been a destruction of the ossistructure used as a fulcrum by the exolever engaged, the distance between the mesial surface and the fulcrum is often so great that the blades of the exolevers previously mentioned are not practicable to direct the tooth farther upward and distally, and exolever No. 7L or 7R is then indicated and the ossistructure along the mesio-

buccal surface is used as a fulcrum, as described for a mesiobuccal application on page 630.

Where the third molar has been directed upward and distally by the application of the exolever to the mesial surface and raised to a point where it is in a mesioangular position, the second molar can often be used to improve the fulcrum provided it is suitable for that purpose. Where, however, the root formation is of such a character that a fracture may result, a buccal application can often be made to complete the extraction. Where the mesial surface is located quite a distance from the superior border of the ossistructure, the initial movement of the exolever handle should not be made mesially, as the

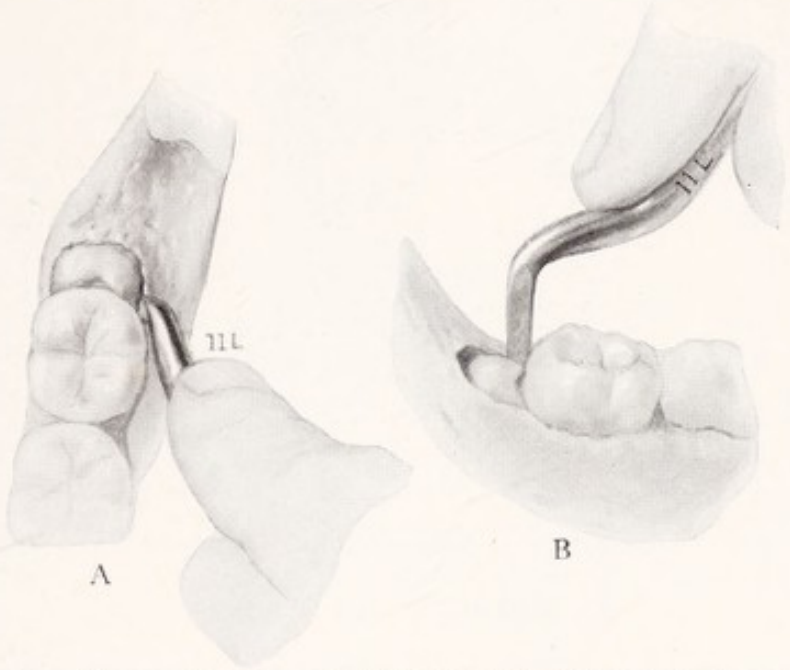


Fig. 665. — Buccal Excision of Ossistructure—Horizontal Impaction—No Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 11L applied to exposed part of buccal surface, viewed from occlusal; *B*, application, viewed buccally.

distance between the mesial surface and the superior border will not permit such a procedure. The handle should be directed downward initially to force the tooth upward and a mesial movement can then be made to complete the extraction. The foregoing technic is similar to that described for a horizontal impaction where the mesial surface is accessible (page 627).

Finger as Accessory.—The operator, when excising the ossistructure on the buccal surface or when applying the exolever to this surface in order to direct it below the mesial surface, should have one of the fingers of his left hand in the region of the lingual surface during the entire operative procedure, for it will then act as an accessory in preventing the tooth from being deflected lingually, and it will also prevent the tooth from traveling lingually, anteriorly or below the socket, and, if this does occur, the tooth will then be located between the soft

tissue and the ossistructure. There may be a space between the buccal surface and the ossistructure on this surface, and, when the ossisector is applied to excise the ossistructure, the pressure of the ossisector, if too forcibly applied, may force the tooth lingually unless a finger is used as an accessory to prevent the occurrence of this incident. Occasionally a case will be presented where there is no ossistructure on the lingual surface, and when unnecessary pressure is applied with the exolever, the tooth may be forced into the soft tissue on the lingual surface unless the precaution indicated is taken.

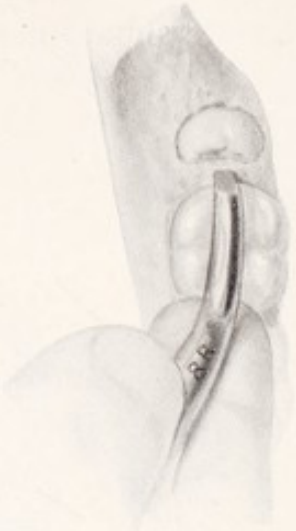


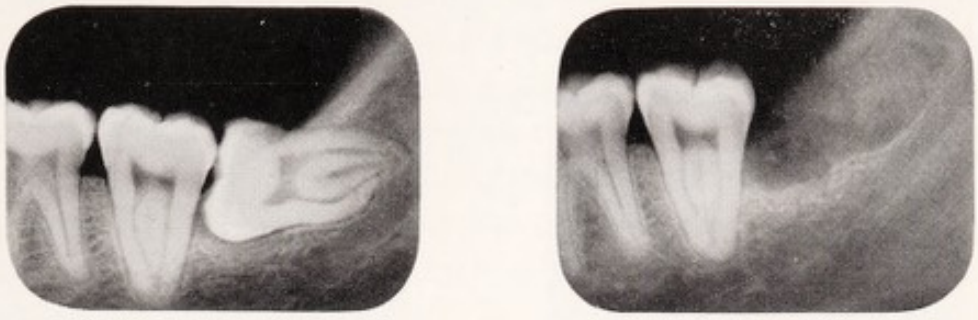
Fig. 666. — Occlusal Excision of Ossistructure—Horizontal Impaction—No Deflection—Mesial Surface Accessible. Ossisector No. 8R applied for excision of ossistructure between occlusal surface of third molar and distal root of second.

SUMMARY OF CASES

In Fig. 667 are shown two radiograms of the same case. In Fig. 667 A the mesial root is inclined distally and the distal root is straight. The ossistructure on the distal surface extends up to the gingival third, and on the buccal surface it extends quite a distance above the mesial surface. The area of pathologic involvement at the mesial surface indicates a space between the buccal surface and the ossistructure on this surface, but no dependence should be placed on the area shown for access to the mesial surface, as the ossistructure on the buccal surface will usually interfere, the excision is made from the superior border to a short distance above the mesial surface. The initial application of the exolever should, where possible, be the final one, so that the involved area at the mesial surface is not broken down any further and the fulcrum subsequently lost. When directing the tooth upward and distally, there will be no liability of fracturing the straight distal root.

During the execution of the exolever technic the precaution should be taken not to use the second molar as a fulcrum or permit the exolever to come in contact in any way with the second molar, as the

roots of the latter tooth are fused and can be loosened very readily. In Fig. 667 B is shown a radiogram of the case after extraction in order that the condition of the second molar may be observed.



A B

Fig. 667. — Horizontal Impaction—No Deflection—Mesial Surface Inaccessible. Same case. *A*, mesial root inclined distally and distal root straight, roots of second molar being fused. The ossistructure on distal surface extends to gingival third, with a slight pathologic condition below mesial surface, and the structure extends over greater part of lingual and buccal surfaces; *B*, case after extraction.

In the cases shown in Fig. 668, where the roots are fused, the ossistructure on the distal surface extends up to the gingival third, and no excision of the ossistructure is indicated. The distance between the superior border of the ossistructure and the mesial surface is not great, and the excision on the buccal surface will not be extensive. The application of the exolever between the mesial surface and the ossistructure below this surface will act as a wedge and will often have a tendency to extract the tooth. If, however, the wedge does not have this effect, very little resistance may be expected when the tooth is directed upward and distally.

Fig. 668. — Horizontal Impaction—No Deflection—Mesial Surface Inaccessible. Roots fused with ossistructure on distal surface extending to gingival third and over part of lingual and buccal surfaces.

In the case shown in Fig. 669 A the mesial root is inclined distally and the apical third of the distal root is inclined mesially. Fig. 669 B is an occlusal view of the case. The excision for access to the mesial surface is made on the mesiobuccal surface a short distance from the superior border of the ossistructure, and on the distal surface the ossistructure extends slightly beyond the gingival third, and is excised down to this point. The tooth is directed upward and distally, and a

fracture of the apical third of the roots may result. The root formation is not favorable for an exolever technic, but the radiogram of the case and an illustration of the tooth after extraction show that a tooth in such a position can be extracted without fracturing the apical third of the root (Figs. 669 C and 669 D).

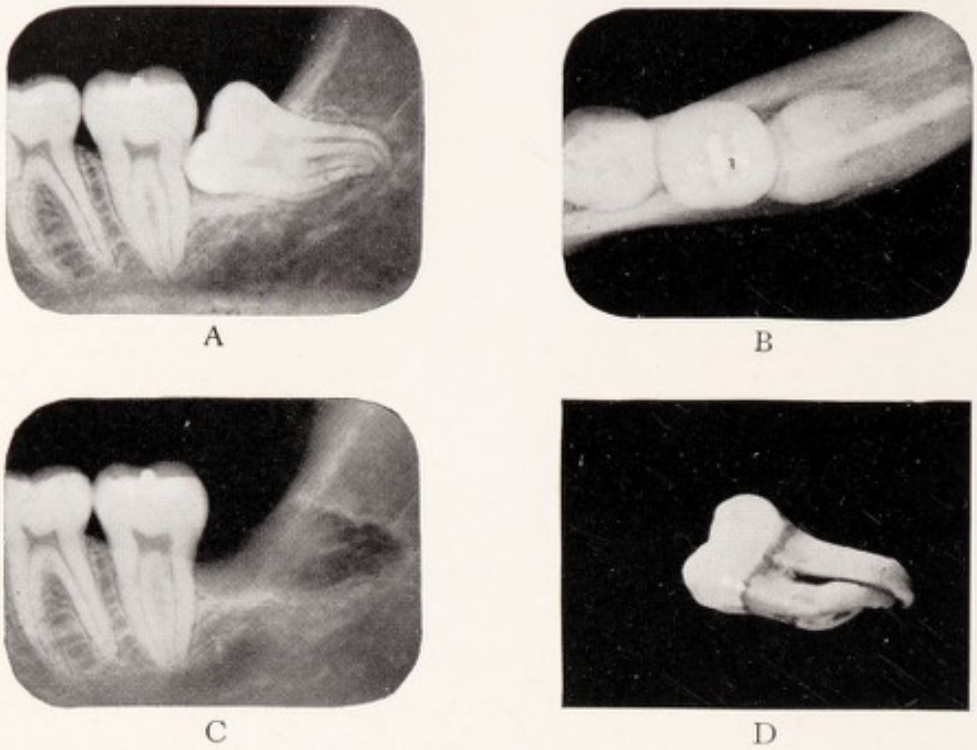


Fig. 669. — Horizontal Impaction—No Deflection—Mesial Surface Inaccessible. Same case. *A*, mesial root inclined distally and distal root inclined mesially, with a slight mesial inclination at apical third. The ossistructure on distal surface extends slightly beyond gingival third and over greater part of lingual and buccal surfaces. *B*, occlusal view; *C*, socket after extraction; *D*, photograph of extracted tooth.

In the case shown in Fig. 670, where the mesial root is inclined distally and the distal root is inclined mesially, no excision of the ossistructure on the distal surface is indicated. The ossistructure below the mesial surface is involved by a pathologic condition, but, as no dependence can be placed on the involved area to allow an immediate application of the exolever to the mesial surface, excision for access is made, and very little resistance will be encountered. The initial appli-

Fig. 670. — Horizontal Impaction—No Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially. The ossistructure on distal surface extends over apical third of root, and over a small part of lingual and buccal surfaces.

cation of the exolever to direct the tooth upward and distally is made with sufficient force to fracture the septum between the roots, and avoid further breaking down of the involved ossistructure below the mesial surface.

In the cases shown in Fig. 671 the conditions are similar to those described in Fig. 670, except that pathologic changes have not extensively involved the ossistructure below the mesial surface, and excision is made on the distal surface to decrease resistance at this point, and it is indicated on the buccal surface to gain access to the mesial surface. When the exolever movements are made to direct the tooth upward and distally, sufficient pressure is applied to fracture the septum between the roots.

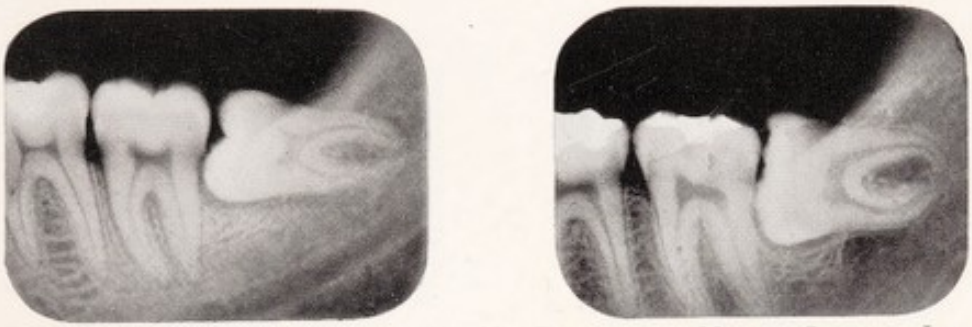
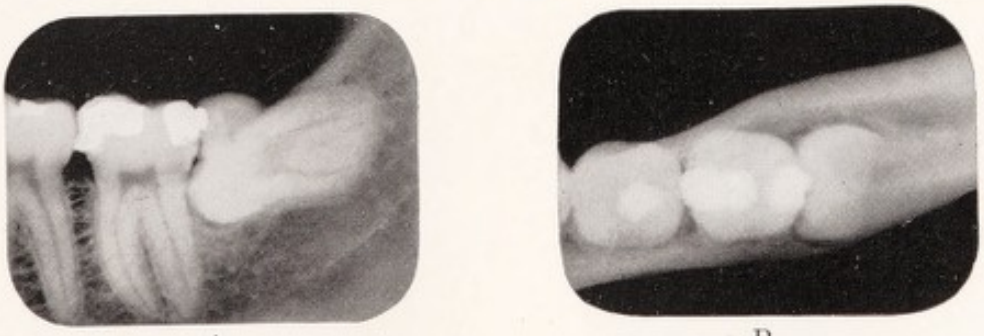


Fig. 671. — Horizontal Impaction—No Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially, with a large septum between roots. The ossistructure on distal surface extends to gingival third and over greater part of lingual and buccal surfaces.

In the case shown in Fig. 672 A, where the mesial root is inclined distally and the distal root is straight, the ossistructure on the distal surface extends up to the gingival third, and, on account of the character of the root formation excision on this surface is indicated. The mesial surface is a short distance from the superior border of the ossistructure, and excision on the buccal surface is made so that the exolever can be applied to the mesial surface. The tooth is directed upward and distally with sufficient force to fracture the septum between the roots, which are large. In Fig. 672 B is shown an occlusal view of the case.



A B

Fig. 672. — Horizontal Impaction — No Deflection — Mesial Surface Inaccessible. *A*, mesial root inclined distally and distal root straight, with ossistructure on distal surface extending to gingival third and over part of lingual and buccal surfaces; *B*, occlusal view of case.

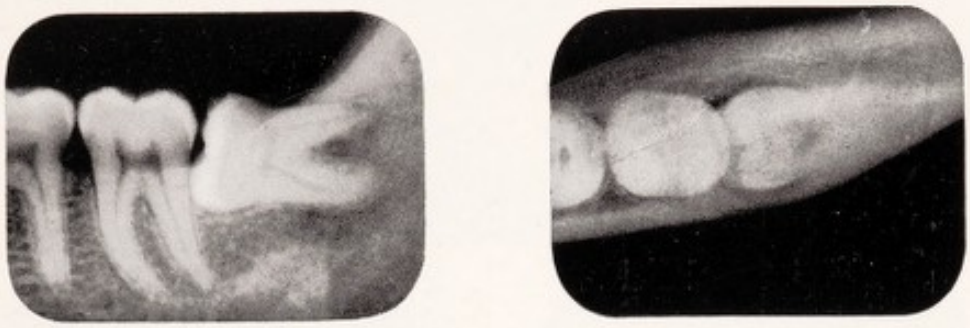
In the cases shown in Fig. 673, where the mesial root is straight and the distal root is inclined mesially, the ossistructure on the distal surface extends up to the gingival third, and extensive excision is made on the distal surface. The mesial surface is at various distances below the superior border of the ossistructure, and in the excision of the ossistructure on the buccal surface the operator should be certain that the mesial surface is reached with the ossisector before the exolever is applied. The force applied with the exolever should be sufficient to fracture the septum between the roots. In the execution of the exolever movements the operator should have no fear of fracturing the roots, provided that sufficient excision on the distal surface has been made.

Fig. 673. — Horizontal Impaction—No Deflection — Mesial Surface Inaccessible. Mesial root straight and distal root inclined mesially, with ossistructure on distal surface extending to gingival third and over part of lingual and buccal surfaces.

In the cases shown in Fig. 674, where the mesial root is straight and the distal root is inclined mesially, the ossistructure on the distal surface extends up to the gingival third, and on account of the character of the root formation, excision on this surface is indicated. There is a variation in the location of the mesial surface in its relation to the superior border of the ossistructure, and excision is indicated on the buccal surface to a distance to permit the application of the exolever. On account of the character of the formation of the roots and the septum between them, some resistance will be encountered when the tooth is directed upward and distally.

Fig. 674. — Horizontal Impaction—No Deflection — Mesial Surface Inaccessible. Mesial root straight and distal root inclined mesially, with ossistructure on distal surface extending to gingival third, with a variation in its location on lingual and buccal surfaces.

In the case shown in Fig. 675 A, where both roots are straight, the ossistructure on the distal surface extends to the gingival third, and, on account of the character of the root formation, a slight excision on this surface is indicated. Excision on the buccal surface from the superior border of the ossistructure to the mesial surface, which is only a short distance, is indicated to obtain access for the exolever to be applied to the mesial surface. The initial application of the exolever to direct the tooth upward and distally is made with sufficient force to fracture the septum between the roots, and, as they possess sufficient strength to overcome the resistance of the septum between them, the operator should have no fear of fracturing the roots. In Fig. 675 B is shown an occlusal view of the case.



A B

Fig. 675. — Horizontal Impaction—No Deflection—Mesial Surface Inaccessible. *A*, both roots straight, with ossistructure on distal surface extending to gingival third and over part of lingual and buccal surfaces; *B*, occlusal view of case.

In the cases shown in Fig. 676, where both roots are straight, the ossistructure extends slightly beyond the gingival third, and extensive excision on the distal surface beyond this point is indicated. There is a variation in the location of the mesial surface in its relation to the superior border of the ossistructure, and excision on the buccal surface is made so that the exolever can be applied to the mesial surface. In an occasional case a pathologic condition involves the area below the mesial surface, and the initial application of the exolever is made with sufficient force to direct the tooth upward and distally in order to fracture the septum between the roots. Usually in this type of

Fig. 676. — Horizontal Impaction — No Deflection—Mesial Surface Inaccessible. Both roots straight, with ossistructure on distal surface extending to gingival third and over greater part of lingual and buccal surfaces.

case the roots are large, with no liability to fracture, as they are of sufficient strength to be directed upward and distally, and will at the same time permit a fracture of the septum without a fracture of the roots.

In the cases shown in Fig. 677 there is a variation in the divergency of the roots and the size of the septum, but the roots are not extreme in length. The ossistructure on the distal surface extends up to the gingival third, and, on account of the character of the root formation, excision on this surface is made distally beyond the gingival third. The distance between the mesial surface and the superior border of the ossistructure is not great, and excision on the buccal surface is indicated. The operator, when applying the exolever to the mesial surface, need not hesitate to direct the tooth upward and distally, as the strength of the roots is usually not sufficient to withstand the resistance of the septum between them, and in the majority of cases the tooth cannot be extracted without causing a fracture of the roots. After the extraction of the crown it will not be difficult to remove the remaining roots.

Fig. 677. — Horizontal Impaction — No Deflection — Mesial Surface Inaccessible. Roots divergent and not strong, with ossistructure on distal surface extending to gingival third and over half of lingual and buccal surfaces.

In the cases shown in Fig. 678, where the mesial root is inclined distally and the distal root is inclined mesially, with the ossistructure on the distal surface extending beyond the gingival third, extensive excision on this surface is necessary. The ossisector is directed between the occlusal surface of the third molar and the distal surface

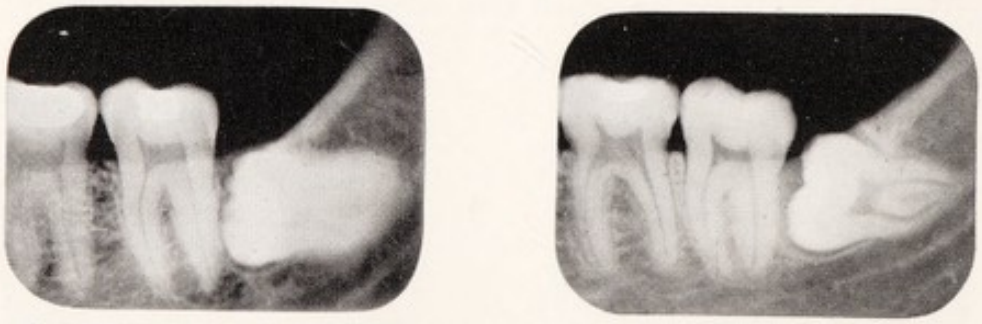


Fig. 678. — Horizontal Impaction — No Deflection — Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially. The ossistructure on distal surface extends beyond gingival third, between occlusal surface of third molar and distal surface of distal root of second molar and over entire lingual and buccal surfaces.

of the distal root of the second to excise any interfering ossistructure that may be over the occlusal surface, care being taken not to mar the distal surface of the distal root of the second molar. Excision on the buccal surface from the superior border down to a short distance above the mesial surface is indicated. When the tooth is directed upward by the application of the exolever to the mesial surface, sufficient pressure is applied to fracture the septum between the roots, provided sufficient excision has been made on the distal surface. As the tooth is being directed upward and distally, exolevers with larger blades are used as may be necessary when the fulcrum is lost.

Fig. 679. — Horizontal Impaction — No Deflection — Mesial Surface Inaccessible. Mesial root inclined distally and distal root straight. The ossistructure extends over entire tooth and between occlusal surface of third molar and distal root of second.

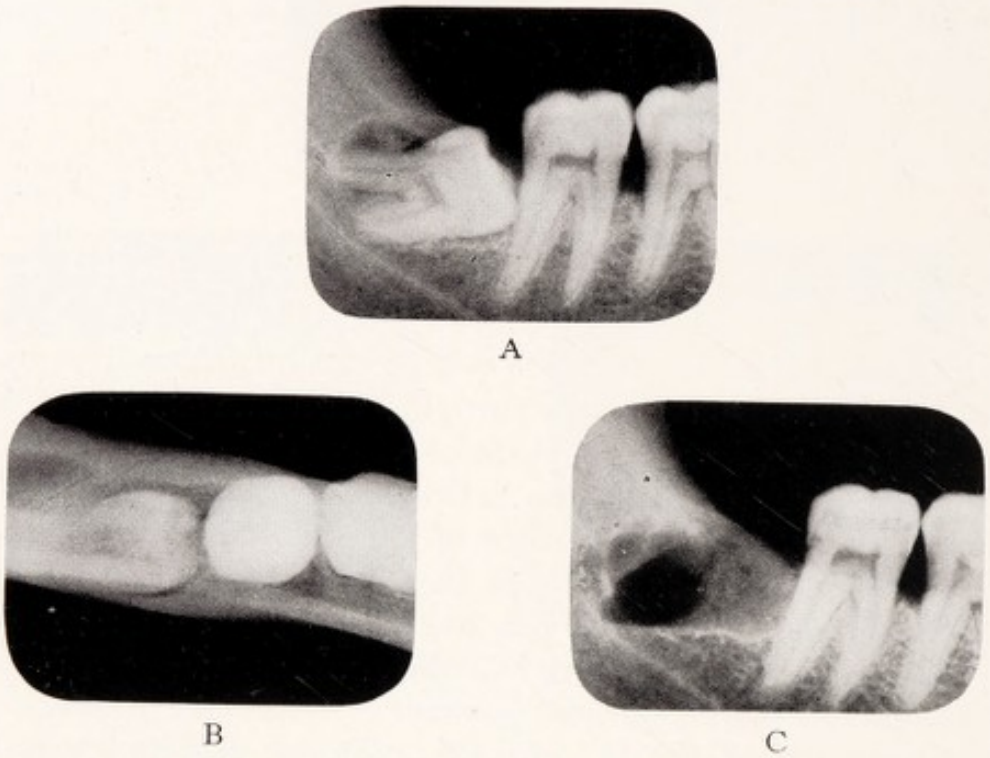
In the case shown in Fig. 679, where the mesial root is inclined distally and the distal root is straight, with the ossistructure extending over the entire tooth, extensive excision on the distal surface is made. The ossistructure between the occlusal surface of the third molar and the distal surface of the distal root of the second is excised where direct excision can be executed, or is fractured away where this procedure is not practicable. Excision on the buccal surface from the superior border of the ossistructure to a short distance above the mesial surface is made. When the tooth is being directed upward and distally with the exolever, the close relation of

A B

Fig. 680. — Horizontal Impaction — No Deflection — Mesial Surface Inaccessible. *A*, mesial root inclined distally and distal root straight. The ossistructure on distal surface extends to gingival third, and area between occlusal surface of third molar and distal surface of distal root of second involved by pathologic condition. *B*, mesial root inclined distally and distal root inclined mesially. The ossistructure extends over entire tooth and occlusal surface of third molar impinges upon distal surface of distal root of second.

the occlusal and mesial surfaces of the third molar with the distal surface of the distal root of the second requires the exolever movements to be made with caution so as not to involve the second molar.

In the case shown in Fig. 680 A, where the mesial root is inclined distally and the distal root is straight, with the ossistructure on the distal surface extending to the gingival third, extensive excision on this surface is indicated. The ossistructure between the occlusal surface of the third molar and the distal surface of the distal root of the second is involved by a pathologic condition, but not to an extent that will obviate excision, and any interfering ossistructure that may be over the occlusal surface is excised. Excision on the buccal surface from the superior border of the ossistructure to a short distance above the mesial surface is indicated. When the tooth



A B C

Fig. 681. — Horizontal Impaction — No Deflection — Mesial Surface Inaccessible. Same case. *A*, mesial root inclined distally and distal root straight. The ossistructure extends over entire tooth and there is a cyst in location of distal root. *B*, occlusal view; *C*, case after extraction.

is directed upward by the application of the exolever to the mesial surface, sufficient pressure is applied to fracture the septum between the roots.

In the case shown in Fig. 680 B the relation of the occlusal surface of the third molar with the apical third of the distal surface of the distal root of the second, in most instances, has involved the distal surface of the distal root of the latter tooth. It has been the experience of the author that, where the second molar has not been disturbed during the extraction of the impacted tooth, checking with radiograms made of the case several months after the operation showed

that bone regeneration had not taken place sufficiently to protect the distal surface of the distal root of the second molar, and there is usually a constant irritation around the tooth.

In the case shown in Fig. 681 A, where the mesial root is inclined distally and the distal root is straight, with the ossistructure extending over the entire tooth, there is a cyst in the location of the distal root, which condition should be treated in conjunction with the removal of the impacted tooth. Excision over the occlusal surface is indicated in advance of the excision on the distal surface. Excision on the buccal surface from the superior border of the ossistructure to a short distance above the mesial surface is made. The tooth is directed upward and distally by the application of the exolever to the mesial surface. Fig. 681 B shows the occlusal view, and Fig. 681 C the socket after the cyst and tooth have been removed.

BUCCAL DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

Where the third molar is impacted in a horizontal position, with the buccal surface deflected buccally out of alignment with the corresponding surface of the second, the deflection is quite an advantage to the operator, as he can use that part of the mesial surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second for the application of the exolever. The approach with the exolever to gain access to the mesial surface is made from a position along that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar and not toward the buccal surface of the third molar, as in the case when this surface is in alignment with the corresponding surface of the second. The extent to which part of the mesial surface is accessible and the occlusal surface is out of alignment with the distobuccal surface will vary from a slight degree in some cases to a point where the entire crown is deflected buccally out of alignment with the second molar. The pressure of part of the occlusal surface of the third molar against part of the distal surface of the second will often cause the contact between the first and second molars to be lost and involve the interseptum between these teeth.

CLINICAL EXAMINATION

Exposed Crown.—A part or the whole of the distal surface and a part of the occlusal surface is usually exposed.

Gum Tissue.—The gum tissue on the distal surface usually extends up to the gingival third, and there is a variation in the location of the gum tissue on the occlusal and buccal surfaces.

RADIOGRAPHIC INTERPRETATION

Crown.—The radiogram shows the crown with a definite enamel cap and pulp chamber, but no part of the occlusal surface is visible. A part of the occlusal surface of the third molar overlaps a part of the distobuccal surface of the second, while the contact point between the first and second molars is approximately normal and no overlap is shown, indicating a deflection of the buccal surface of the third molar out of alignment buccally with the corresponding surface of the second.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root straight and distal root inclined mesially, 7; mesial root inclined distally and distal root inclined mesially, 7; both roots straight, 5; fused roots, 5; mesial root inclined distally and distal root straight, 2; partially developed roots, 2, and hypercementosed roots, 2.

Ossistructure.—Pathologic changes involve the ossistructure in various degrees on the distal root of the second molar and below the mesial surface of the third. The latter surface is accessible to the immediate application of the exolever. The ossistructure on the distal surface usually extends up to the gingival third, and the greater part of the buccal and lingual surfaces is free of ossistructure.

OPERATIVE TECHNIC

Gum Tissue Technic.—Where the crown is exposed, a slight incision of the gum tissue is made distally along the buccal surface, or in alignment with the buccal surface of the second molar, to a point where the gum tissue will not interfere with directing the tooth upward and distally out of its socket, and that will permit excision of the ossistructure on the distal surface when indicated. A second incision is made, when indicated, over that part of the occlusal surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second, extending downward and buccally (Fig. 682).

Ossistructure Technic.—As the distal surface is free of ossistructure beyond the gingival third, excision is not usually indicated. An operator not accustomed to the use of the exolever may in this case excise part of the ossistructure on the distal surface in line with the deflected tooth to decrease resistance at this point, which excision is made as described on page 625. No excision is necessary over that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, or on the buccal or mesial surface.

Exolever Technic.—When the clinical examination of the exposed crown or the incision of the gum tissue over the occlusal surface has been made, the operator determines the extent of the deflection of part of the occlusal surface of the third molar out of alignment buccally with the distobuccal surface of the second. Where a part of the occlusal surface is deflected buccally, exolever No. 6L or 7L for the left side or No. 6R or 7R for the right side is selected. The gum tissue over that part of the occlusal surface that is out of alignment buccally with the distobuccal surface of the second molar is displaced with the back of the blade, and the blade is applied downward along that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar (Fig.

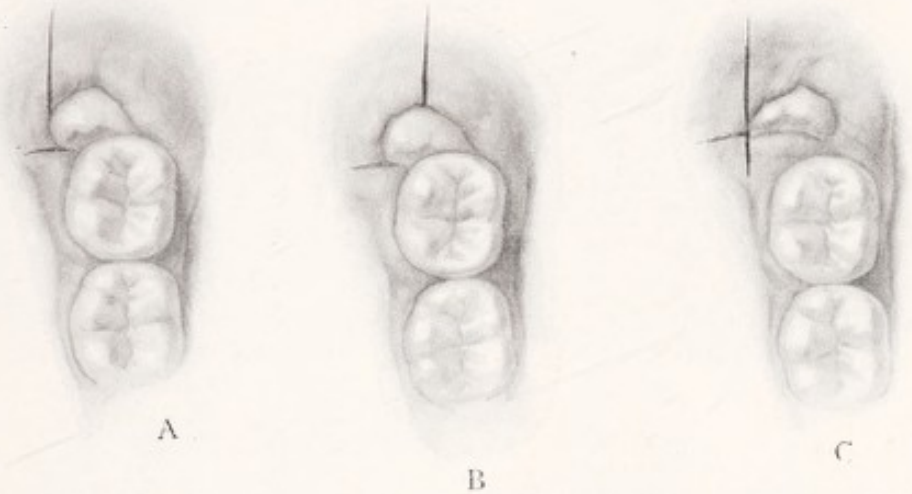


Fig. 682. — Gum Tissue Technic — Horizontal Impaction — Buccal Deflection—Mesial Surface Accessible. *A*, incision distally along buccal surface and downward and buccally along that part of occlusal surface that is deflected buccally out of alignment with distobuccal surface of second molar; *B*, incision distally in alignment with buccal surface of second molar and downward and buccally along occlusal surface that is deflected buccally out of alignment with distobuccal surface of second molar; *C*, incision distally along buccal surface, mesial to deflected buccal surface, and downward and buccally where tissue extends over occlusal surface.

683 A). When the mesial surface is reached, the handle of the exolever is directed mesially, the blade being applied at the same time below the mesial surface of the third molar until it is adjusted to the greater part of the accessible mesial surface. With the back of the blade resting upon the ossistructure mesial to the occlusal surface as a fulcrum, the tooth is directed upward and distally out of its socket by forcing the handle downward (Fig. 683 B) and repeated applications, if necessary, can be made.

Where the tooth has been directed upward and distally and a great deal of resistance is encountered, on account of the character of the root formation or in case pathologic changes have weakened the structure, the fulcrum below the mesial surface or anterior to that part of the occlusal surface that is deflected buccally out of align-

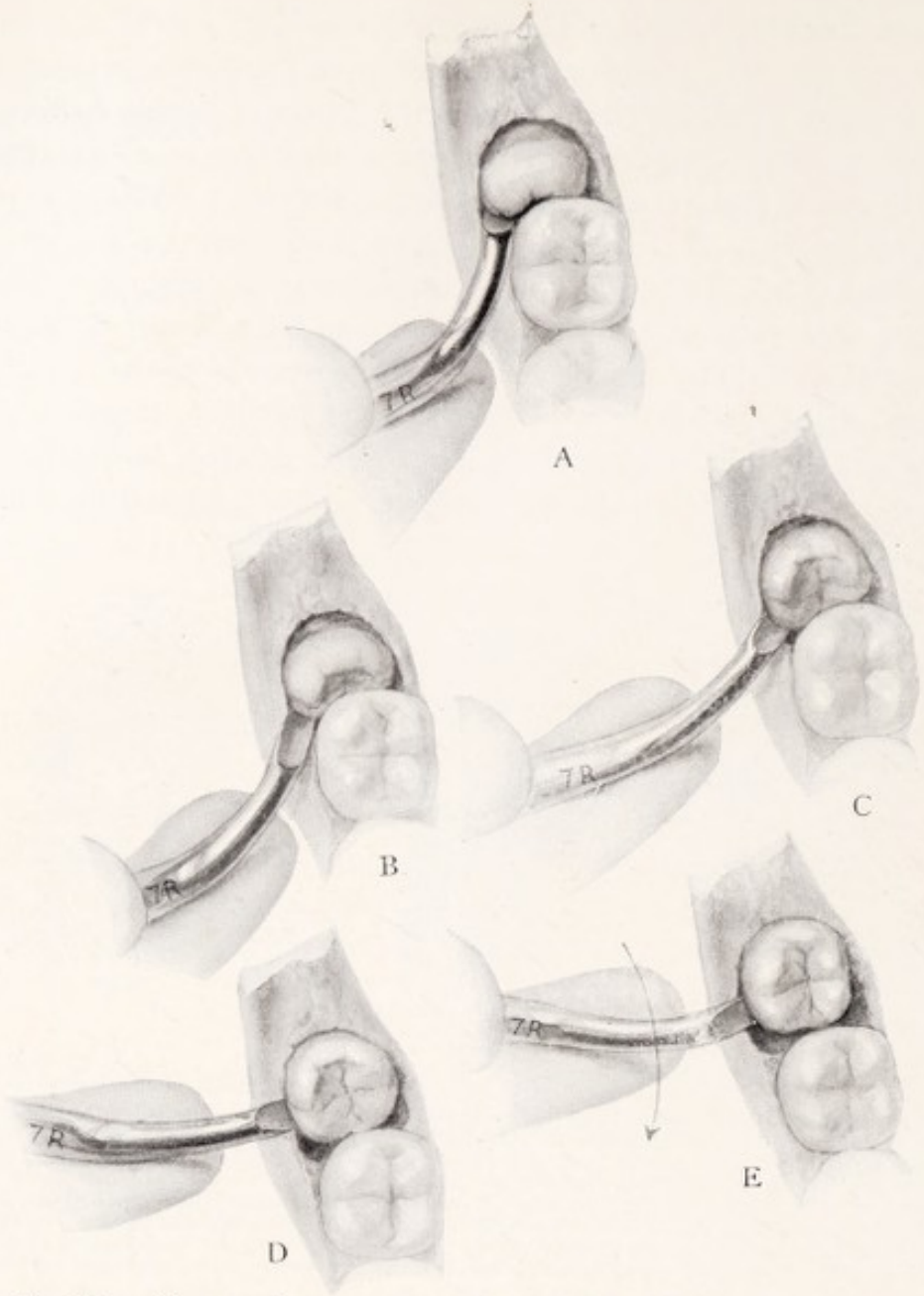


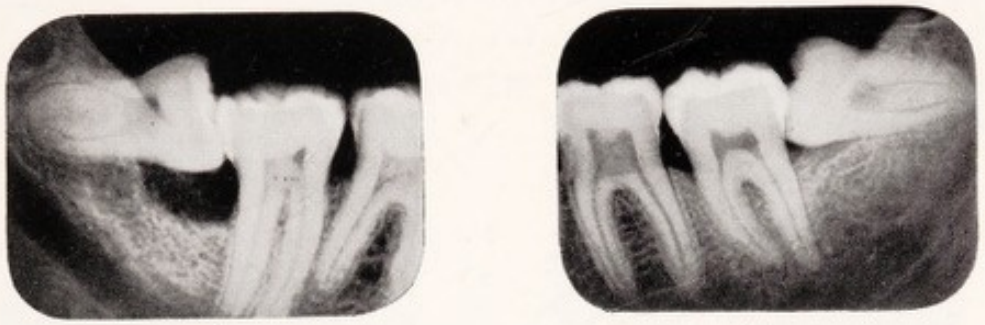
Fig. 683. — Mesial Application of Exolever — Horizontal Impaction — Buccal Deflection—Mesial Surface Accessible. *A*, exolever No. 7R applied downward along that part of occlusal surface of third molar that is deflected buccally out of alignment with distobuccal surface of second; *B*, blade directed below mesial surface and tooth directed upward and distally; *C*, handle directed buccally and blade below mesial surface, ossistructure on buccal surface being utilized as a fulcrum; *D*, blade applied farther distally along mesial surface and tooth directed upward and distally; *E*, tooth has cleared distal surface of second molar and handle turned mesially to direct tooth out of socket.

ment with the distobuccal surface of the second molar will not be a good one. The handle is then directed to a slight extent buccally, and the blade is adjusted below the mesial surface with the back resting upon the ossistructure along the buccal surface as a fulcrum and then pressure is applied downward upon the handle (Fig. 683 C). When the latter procedure is being executed and the tooth is being directed upward and distally the blade is reapplied farther distally upon the mesial surface as the fulcrum is lost, as shown in Fig. 683 D.

After the crown has cleared the distal surface of the second molar, the handle is then directed mesially and the tooth upward and distally out of the socket (Fig. 683 E).

In case the fulcrum between the mesial surface and the ossistructure below this surface is weakened to such an extent that it will no longer be serviceable, exolever No. 3L, 4L or 5L for the left side or No. 3R, 4R or 5R for the right side is selected. The blade is adjusted between the superior border of the ossistructure along the buccal surface and the mesial surface, and the tooth is directed upward and distally to complete the extraction.

Where a pathologic involvement below the mesial surface of the third molar is as extensive as is shown in Fig. 684 A, exolever No. 5L for the left side or No. 5R for the right side is selected. The exolever is applied to the buccal surface in order that it may be



A B

Fig. 684. — Horizontal Impaction — Buccal Deflection — Mesial Surface Accessible. *A*, mesial root inclined distally and distal root inclined mesially. The ossistructure on distal surface extends to gingival third, with extensive pathologic condition below mesial surface, and entire lingual and buccal surfaces free of ossistructure; *B*, roots fused. The ossistructure on distal surface extends to gingival third, with slight pathologic condition below mesial surface, and greater part of lingual and buccal surfaces free of ossistructure.

adjusted below the mesial surface instead of the latter surface being approached from that part of the occlusal surface that is deflected out of alignment buccally with the distobuccal surface of the second molar. The gum tissue on the buccal surface is displaced with the back of the blade, and the flat side of the blade engages this surface. The point of the exolever is directed into the space between the mesial surface and the involved ossistructure below this surface, the blade being inserted as far as possible to obtain a good fulcrum. When the blade has been wedged between the mesial surface and the ossistructure below this surface, the tooth is directed by a forcible movement upward and distally out of its socket by turning the handle mesially. If at all possible, such a movement is made forcibly, as repeated applications of the exolever will weaken the ossistructure below the mesial surface, causing the fulcrum to be placed farther away from this surface. Pathologic involvement has usually weakened the ossistructure around the tooth, so that very little resistance

may be expected, but the upward and distal movement is made with sufficient force to fracture the septum between the roots and not permit part of the lingual plate to be fractured away with the tooth.

Where there is only a slight deflection or where the foregoing technic is not practicable, owing to the absence of a suitable fulcrum, the adjustment of exolever No. 7L or 7R is then made to the mesiobuccal surface, the superior border of the ossistructure being utilized as a fulcrum (Fig. 650, page 629).

SUMMARY OF CASES

In the case shown in Fig. 684 A, where the mesial root is inclined distally and the distal root is inclined mesially, no excision of the ossistructure is indicated. The area of pathologic involvement below the mesial surface is large, and the exolever blade should be slightly larger than the space shown between the mesial surface and the ossistructure below this surface. When the tooth is being directed upward and distally, the initial application of the exolever is made deliberately.

A B

Fig. 685. — Horizontal Impaction — Buccal Deflection — Mesial Surface Accessible. *A*, mesial root inclined distally and distal root inclined mesially. The ossistructure on distal surface extends to gingival third and over part of lingual and buccal surfaces, with a pathologic condition below mesial surface. *B*, mesial root inclined distally and distal root inclined mesially, with ossistructure on distal surface extending to gingival third and over part of lingual and buccal surfaces.

In the case shown in Fig. 684 B, where the roots are fused, no excision of the ossistructure is indicated. The exolever is applied below that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, and the tooth is directed upward and distally, very little resistance being encountered in this procedure.

In the case shown in Fig. 685 A, where the mesial root is inclined distally and the distal root is inclined mesially, with a small septum between them, no excision of the ossistructure is indicated. The exolever is applied below that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar. The ossistructure below this surface is involved by a

pathologic condition, and the tooth is directed upward and distally by the application of considerable pressure with the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar in order to fracture the septum between the roots. If it is seen that the tooth cannot be directed out of its socket by the foregoing procedure on account of pathologic involvement below the mesial surface, an exolever with a blade of a size that will fit the space created is then adjusted from the buccal surface between the mesial surface and the ossistructure along the buccal surface, and the exolever movements are again executed upward and distally.

In the case shown in Fig. 685 B, where the mesial root is inclined distally and the distal root is inclined mesially, with a small septum between the roots, no excision of the ossistructure is indicated. There is no pathologic involvement below the mesial surface. The exolever

Fig. 686. — Horizontal Impaction — Buccal Deflection — Mesial Surface Accessible. Mesial root straight and distal root inclined mesially, with ossistructure on distal surface extending to gingival third, and greater part of lingual and buccal surfaces free of ossistructure.

is applied below that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, and the movements to direct the tooth upward and distally are deliberately executed.

In the cases shown in Fig. 686, where the mesial root is straight and the distal root is inclined mesially, no excision of the ossistructure is indicated. There is a liability of a part of the thin lingual plate remaining attached to the tooth, and a deliberate exolever movement upward and distally may avoid this occurrence, as there is no danger of fracturing the roots, although the septum between them will cause some resistance.

In the case shown in Fig. 687 A, where the roots are divergent, a slight excision on the distal surface is indicated in order to decrease resistance. Considerable resistance, on account of the root formation, will be encountered when the exolever movements are executed upward and distally. The initial approach is made by applying the exolever to that part of the occlusal surface that is deflected buc-

cally out of alignment with the distobuccal surface of the second molar in order to apply the blade below the mesial surface, and as soon as the tooth has been directed upward and distally the exolever is then applied along the buccal surface in order to engage the greater part of the available mesial surface, this application is made so as to be able to utilize the superior border of the ossistructure along the buccal surface as a fulcrum. The tooth is then directed upward out of its socket and no fracture of the roots should result.

In the case shown in Fig. 687 B, where both roots are large and hypercementosed, the enlargement should not intimidate the operator, as a fracture of the roots will not occur and the increased resistance is overcome by further excision on the distal surface, as this surface is free of ossistructure down to the gingival third. The exolever technic is executed as described in the case shown in Fig. 687 A.

A B

Fig. 687. — Horizontal Impaction — Buccal Deflection — Mesial Surface Accessible. *A*, crown large and roots divergent, with ossistructure on distal surface extending to gingival third, and lingual and buccal surfaces free of ossistructure; *B*, roots hypercementosed, with ossistructure on distal surface extending to gingival third, and greater part of lingual and buccal surfaces free of ossistructure.

BUCCAL DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

Cases where the buccal surface of the third molar is deflected out of alignment buccally with the buccal surface of the second molar, with the mesial surface inaccessible to the application of the exolever, are more frequently seen than where the tooth is deflected buccally and the mesial surface is accessible. Pathologic changes do not involve the ossistructure below the mesial surface to the same extent as in the case where the mesial surface is accessible. Where the third molar is deflected so that the mesial surface is inaccessible, the operator takes advantage of the deflection and excises the ossistructure over the part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar and is free of contact with the distal surface of the second molar, so that the exolever may be applied to that part of the mesial surface that is deflected buccally out of alignment with the disto-

buccal surface of the second molar, and by this procedure avoid excision of the ossistructure on the buccal surface. Where pathologic changes involve the ossistructure on the greater part of the distal surface of the distal root of the second molar and the interseptum between the first and second molars, the operator should use his judgment, according to the conditions presented, as to the probability of conserving the second molar.

CLINICAL EXAMINATION

Exposed Crown.—As a rule, no part of the crown is exposed, but should there be any exposure, it will be only a small part of the distoclusal or distal surface. Where a part of the crown is exposed, the operator determines the extent of the deflection of the distoclusal and buccal surfaces of the third molar compared with the distobuccal surface of the second.

Gum Tissue.—The gum tissue usually covers the entire crown.

RADIOGRAPHIC INTERPRETATION

Crown.—The radiogram shows the crown with a definite enamel cap and pulp chamber, and no part of the occlusal surface is visible. There is an overlap of the occlusal surface of the third molar upon the distobuccal surface of the second, indicating a buccal deflection of the third molar. There is no overlap, at the contact point, of the first molar upon the second, and this checks the interpretation that the third molar is deflected buccally.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: fused roots, 18; mesial root inclined distally and distal root inclined mesially, 13; mesial root inclined distally and distal root straight, 12; both roots straight, 3; both roots inclined distally, 3; divergent roots, 3; partially developed roots, 3, and hypercementosed roots, 2.

Ossistructure.—The ossistructure usually extends up to and sometimes slightly beyond the gingival third, and in an extremely rare case it will cover the entire distal surface. No excision of the ossistructure on the buccal surface is indicated, but the superior border on this surface is taken as a guide in determining the extent of excision of the ossistructure over that part of the occlusal surface of the third molar that is deflected buccally out of alignment with the distobuccal surface of the second, and the excision is made over the occlusal surface from the superior border of the ossistructure down to the mesial surface. A pathologic condition involving the mesial surface is not so frequent in this type as in the case of a buccal

deflection where the mesial surface is accessible. If a pathologic condition involves this surface, it is usually in a case where the occlusal surface of the third molar impinges upon the middle third of the distal root of the second and where the pressure has caused the contact between the first and second molars to be lost. A pathologic condition that has started in the region of the interseptum between the first and second molars will progress along the buccal surface of the second molar to the space between the occlusal surface of the third molar and the distal surface of the distal root of the second, attacking the ossistructure in this region and extending below the mesial surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—An incision of the gum tissue is made on the distobuccal surface of the second molar anterior to or in alignment with that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar. This incision is made downward and buccally to gain access to the occlusal surface of the third molar in order to excise the ossistructure over this surface and to apply the exolever below the mesial surface. Care should be taken not to injure the incised gum tissue during the application of the ossisector or exolever, as the tissue is to be replaced to its original position. A second incision is made along the buccal half of the distal surface of the second molar, and a third incision is made distally along the buccal surface of the third molar to a point where the gum tissue on the distal surface can be displaced with the ossisector to permit excision in this region. Where the tooth can be directed upward and distally with the exolever adjusted to that part of the mesial surface that is out of alignment buccally with the distobuccal surface of the second molar, no application is indicated on the buccal surface; the incision is then made distally in alignment with the center of the distal surface.

In Fig. 688 are shown lingual and occlusal radiograms of a case where the incision has been determined from the radiographic interpretation.

Ossistructure Technic—Distal Excision.—The initial excision of the ossistructure on the distal surface is made with ossisector No. 2L for the left side or No. 2R for the right side. The gum tissue on the distal surface is displaced with the back of the blade, and the blade is directed distally to a point where the operator intends to excise the ossistructure, when sufficient excision is made to decrease any resistance that may be presented, as described on page 639, The deflection of the crown of the third molar out of alignment

buccally with the crown of the second should be borne in mind, and the blade kept directly over the distal surface, the excision extending beyond the gingival third, but no ossistructure buccal or lingual to this surface is excised. Rarely does a pathologic condition involve the ossistructure on the distal surface. Where the ossistructure ex-

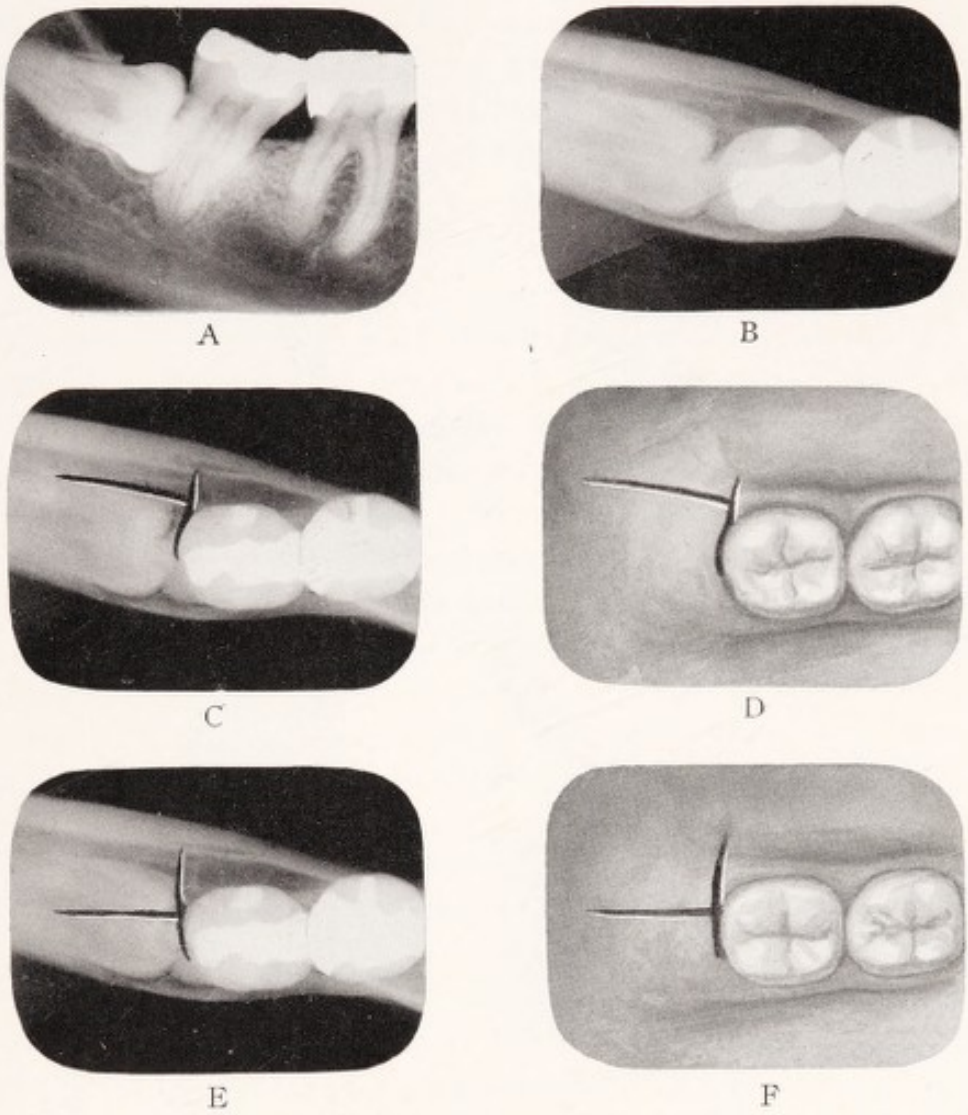


Fig. 688. — Gum Tissue Technic — Horizontal Impaction — Buccal Deflection—Mesial Surface Inaccessible. *A*, radiogram of a buccal deflection; *B*, occlusal view of same case; *C*, incision made downward and buccally along that part of occlusal surface deflected buccally out of alignment with buccal surface of second molar and on buccal half of distal surface of second molar, distally along buccal surface; *D*, occlusal view; *E*, incision made distally over center of distal surface; *F*, occlusal view.

tends over the greater part of the tooth, after the initial excision has been made, ossisector No. 4L or 4R is used to continue the excision.

Occlusal Excision.—When the ossistructure on the distal surface has been excised, the ossistructure over that part of the occlusal surface that is deflected buccally out of alignment with the disto-buccal surface of the second molar is excised from the superior border

down to the mesial surface. Ossisector No. 8L for the left side or No. 8R for the right side is selected. The gum tissue over that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar is displaced with the back of the blade, and the blade is directed downward on the occlusal surface that is free of ossistructure. When the blade reaches

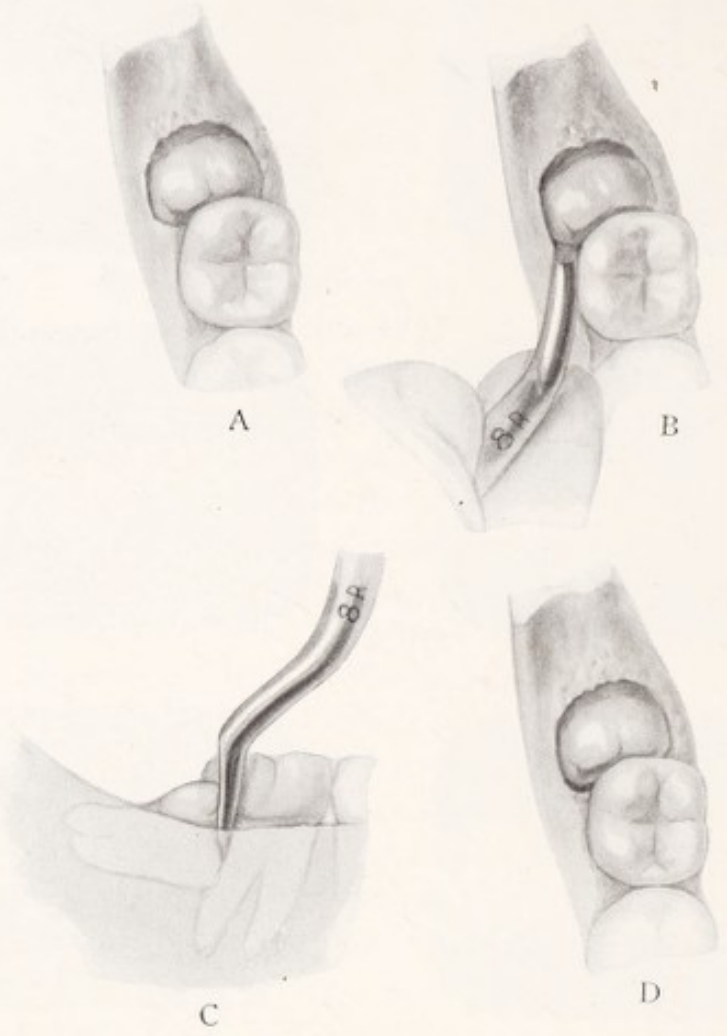


Fig. 689. — Occlusal Excision of Ossistructure — Horizontal Impaction — Buccal Deflection—Mesial Surface Inaccessible. *A*, occlusal view, showing ossistructure over that part of occlusal surface that is deflected buccally out of alignment with distobuccal surface of second molar; *B*, occlusal view, showing ossisector No. 8R applied for excision of ossistructure over that part of occlusal surface that is deflected buccally out of alignment with distobuccal surface of second molar; *C*, buccal view; *D*, extent of excision.

the superior border, it is directed slightly anterior to the occlusal surface, where the excision is started, and is then directed toward the occlusal surface until the mesial surface has been reached. During this procedure the blade of the ossisector is often at right angle to the occlusal surface. Excision is continued downward on this surface until the deflected part is free of ossistructure and the mesial surface has been reached (Fig. 689).

As the blade of the ossisector is dulled by coming in contact with the enamel, several ossisectors of the same design should be available and used as conditions may require.

Exolever Technic.—When the ossistructure on the distal surface has been excised down to the gingival third and over that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to the mesial surface, exolever No. 6L or 7L for the left side or No. 6R or 7R for the right side is selected, dependence being placed on the distance between the mesial surface and the superior border of the ossistructure and on the extent of the deflection of that part of the occlusal surface that is out of alignment buccally with the distobuccal surface of the second molar. The gum tissue over that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar is displaced with the back of the blade, and the blade is directed downward on this surface until the mesial surface has been reached, when it is directed below this surface. The handle of the exolever is directed downward with such force as may be indicated by the root formation and the size of the septum between the roots, which movement will direct the tooth upward and distally out of its socket (Fig. 683, page 658). Where a pathologic condition involves the ossistructure along that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar or where the structure at this point is not a suitable fulcrum, the exolever blade is adjusted below the mesiobuccal surface, and the structure along the buccal surface is used as a fulcrum to direct the tooth upward and distally out of its socket, as illustrated in Fig. 650, page 629. Where the distal movement is arrested on account of the resistance of the roots and septum between them, and the tooth has been directed upward and distally to a point where the superior border of the ossistructure along the buccal surface can be utilized as a fulcrum, exolever No. 3L, 3R; No. 4L, 4R; or No. 5L, 5R is adjusted from the buccal surface between the mesial surface and the superior border, and the tooth is directed farther upward and distally by turning the handle of the exolever mesially.

Where the third molar, by application of the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, is raised to a point where the tooth is in a mesioangular position and clear of the distal surface of the second molar, and the root formation is of such a character that a fracture is possible, the exolever movements upward and distally are discontinued. The extraction is then completed by a buccal application, as in the case where the tooth is in a mesioangular position.

SUMMARY OF CASES

In the case shown in Fig. 690, where both roots are inclined distally, the ossistructure on the distal surface extends almost up to the occlusal surface, and on account of the distal inclination of both roots, quite an extensive excision is made on the distal surface. When excising in the region of that part of the occlusal surface that is out of alignment buccally with the distobuccal surface of the second molar to gain access with the exolever below the mesial surface, or when applying the exolever movements after the excision, care should be taken not to direct the third molar against the second, as the roots of the latter tooth are conical in shape and fused into a solid mass, and the tooth is liable to be loosened or forced out of its socket.

Fig. 690. — Horizontal Impaction — Buccal Deflection — Mesial Surface Inaccessible. Both roots inclined distally, with ossistructure on distal surface extending beyond gingival third and over greater part of lingual and buccal surfaces.

In the cases shown in Fig. 691, where the mesial root is inclined distally and the distal root is straight, and the distal surface is free of ossistructure down to the gingival third, excision is indicated on this surface. Excision is indicated over that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to gain access to the mesial surface with the exolever. When excising in the region of the occlusal surface, the operator should be certain that the ossisector extends to the mesial surface, and exert sufficient force, when applying the exolever technic, to direct the tooth upward and distally to a point where the tooth is in a mesioangular position and a buccal application can be made to complete the extraction.

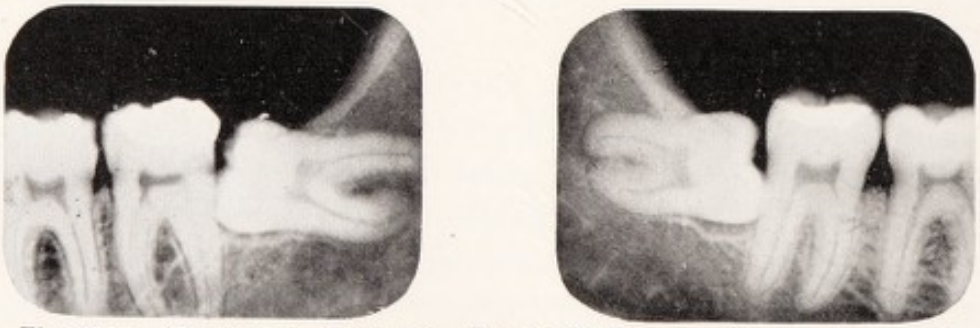


Fig. 691. — Horizontal Impaction—Buccal Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root straight, with ossistructure on distal surface extending to gingival third and over greater part of lingual and buccal surfaces.

In the cases shown in Fig. 692 A, where the roots are fused and the ossistructure extends up to the gingival third, no excision on the distal surface is indicated. Excision is made over that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar, and when the exolever is applied to direct the tooth upward and distally, very little resistance will be encountered. Fig. 692 B shows the socket after extraction and Fig. 692 C shows an occlusal view.

A

B

C

Fig. 692. — Horizontal Impaction—Buccal Deflection—Mesial Surface Inaccessible. *A*, roots fused, with ossistructure on distal surface extending to gingival third and over greater part of lingual and buccal surfaces; *B*, socket after extraction; *C*, occlusal view.

In the cases shown in Fig. 693, where the mesial root is inclined distally and the distal root is inclined mesially, with a variation in the size of the septum between them, and where the ossistructure on the distal surface extends up to the gingival third, excision to decrease

Fig. 693.—Horizontal Impaction — Buccal Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially, with ossistructure on distal surface extending to gingival third and over greater part of lingual and buccal surfaces.

resistance at this point is indicated. Excision is also made over that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to gain access to the mesial surface. Sufficient pressure is exerted upward and distally on the initial application of the exolever to fracture the septum between the roots and to prevent a part of the lingual plate from being carried away when the tooth is directed out of its socket.

In the cases shown in Fig. 694, where the mesial root is inclined distally and the distal root is inclined mesially, with the ossistructure on the distal surface extending up to the gingival third, excision on this surface is indicated on account of the character of the root formation, and excision is also indicated over that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar in order to gain access with the exolever to the mesial surface. In these cases the mesial surface appears to be accessible, but no dependence can be placed on the pathologic condition below this surface, in order to gain access with the exolever to the mesial surface, without first excising for access, as the ossistructure on the occlusal surface or along the buccal surface will not permit access without excision. The ossistructure on the distal surface of the distal root of the second molar and below the mesial surface of the third is involved by a pathologic condition, and the interseptum between the first and second molars is involved to a slight extent. In some of these cases the third molar can be extracted and the second molar retained, the latter tooth being restored by palliative treatment so as to be of future service.

Fig. 694.—Horizontal Impaction — Buccal Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially. The ossistructure on distal surface extends to gingival third, with a pathologic involvement below mesial surface, which involves distal surface of distal root of second molar. Part of lingual and buccal surfaces free of ossistructure.

In the case shown in Fig. 695 A, where the mesial root is inclined distally and the distal root is straight, the roots being fused, the ossistructure on the distal surface extends to the occlusal surface and excision is indicated to the gingival third. The ossistructure extends over the entire occlusal surface, which is not in contact with the second molar, and excision is made over that part of the occlusal surface

that is deflected buccally out of alignment with the distobuccal surface of the second molar in order to apply the exolever below the mesial surface to direct the tooth upward and distally. Excision should also be made between the lingual half of the occlusal surface of the third molar and the distal root of the second. Figure 695 B shows an occlusal view, and, as the lingual radiogram had the appearance of a case where there is no deflection, the ossistructure between the occlusal surface of the third molar and the distal root of the second prevented the interpretation of a buccal deflection. The occlusal view, however, shows the extent of buccal deflection.

A B

Fig. 695. — Horizontal Impaction—Buccal Deflection—Mesial Surface Inaccessible. *A*, mesial root inclined distally and distal root straight, roots being fused, with ossistructure on distal surface extending to occlusal surface and between occlusal surface of third molar and distal root of second. The ossistructure extends over entire lingual and buccal surfaces; *B*, occlusal view.

In the cases shown in Fig. 696, where the roots are divergent and the ossistructure on the distal surface extends up to the gingival third, extensive excision on this surface is made distally beyond the gingival third, and excision is also made over that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to gain access with the exolever to the mesial surface. When the tooth is being directed upward and distally, a great deal of resistance will be encountered, but the pressure applied will not cause a fracture of the roots if sufficient excision has been made on the distal surface.

Fig. 696. — Horizontal Impaction—Buccal Deflection—Mesial Surface Inaccessible. Roots divergent, with ossistructure on distal surface extending up to gingival third and over greater part of lingual and buccal surfaces.

In the cases shown in Fig. 697 the mesial root is inclined distally and the distal root is straight. Excision is indicated on the distal surface and over that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar. In directing the tooth upward and distally force is exerted, as the septum between the roots is readily fractured, and, if sufficient pressure is not applied, there is a liability of the roots being fractured at the apical third.

Fig. 697. — Horizontal Impaction—Buccal Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root straight. The ossistructure on distal surface extends to gingival third and over greater part of lingual and buccal surfaces.

In the case shown in Fig. 698 A where the mesial root is inclined distally and the distal root is straight, with a large septum between them, the ossistructure extends on the distal surface to the gingival third and is excised distally beyond this point, on account of the character of the root formation, in order to decrease resistance. Excision is indicated over that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to allow the adjustment of the exolever to the mesial surface.

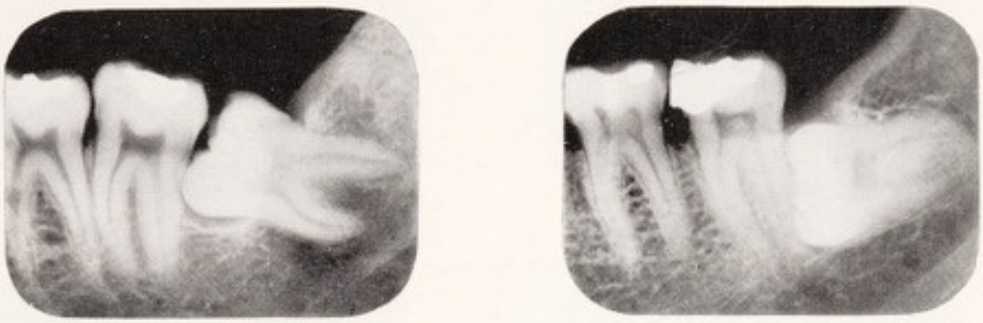
As a result of pressure, the contact of part of the occlusal surface of the third molar with part of the distal surface of the distal root of the second has caused the occlusal surface of the second molar to be deflected upward beyond the occlusal surface of the first molar.

When the exolever is adjusted to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to direct the tooth upward and distally, no attempt should be made to direct the tooth completely out of the socket, but only to a distance where the crown has cleared the distal surface of the second molar and is in a mesioangular position, and the extraction can be completed by a buccal application.

In the case shown in Fig. 698 B, where the mesial root is inclined distally and the distal root is inclined mesially, the ossistructure extends over the greater part of the distal surface.

When the occlusal surface of the third molar is in contact with the apical third of the distal root of the second, it will be very difficult

to determine any involvement of the distal root of the second molar. In the majority of cases, however, there is an absorption of the distal root of the second molar, caused by pressure of the occlusal surface of the third. The area involved is usually not so extensive as in the case of a buccolingual deflection where the occlusal surface of the third molar impinges upon the distobuccal surface of the distal root of the second. Where there is no pressure absorption of the second molar, extensive excision of the ossistructure on the distal surface of the third molar beyond the gingival third is indicated. Excision is also made over that part of the occlusal surface of the third molar that is out of alignment buccally with the distobuccal surface of the second from the superior border of the ossistructure down to the mesial surface, and when this excision is being made, care should be taken not to allow the blade to come in contact with the ossistructure protecting the



A B

Fig. 698. — Horizontal Impaction—Buccal Deflection—Mesial Surface Inaccessible. *A*, mesial root inclined distally and distal root straight, with ossistructure on distal surface extending to gingival third and over greater part of lingual and buccal surfaces. The occlusal surface of second molar is deflected upward beyond corresponding surface of first molar. *B*, mesial root inclined distally and distal root inclined mesially, with ossistructure extending over greater part of distal surface and entire lingual and buccal surfaces.

buccal surface of the distal root of the second molar. As the mesial surface of the third molar cannot be directed upward and distally to the superior border of the ossistructure without causing considerable trauma, excision on the buccal surface is indicated from the superior border to a point midway between the mesial and distal surfaces, which will be about the distance that the mesial surface can be directed upward by the application of the exolever to that part of the mesial surface that is out of alignment buccally with the distobuccal surface of the second. When the mesial surface has been directed upward to a point where an exolever can be applied below the mesial surface from the buccal surface, the ossistructure along this surface being utilized as a fulcrum, the tooth is directed upward and distally out of its socket.

In Fig. 699 is shown an unusual case of a horizontal impaction where the tooth is deflected buccally and the mesial surface is inaccessible.

In Fig. 699 A is shown a lingual radiogram where the mesial root is inclined distally and the distal root is inclined mesially, with a septum between them, and the ossistructure extends on the distal surface slightly beyond the gingival third, which is excised on account of the character of the root formation in order to decrease resistance. Excision is indicated over that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar in order to gain access with the exolever to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar. No excision is indicated on the buccal surface, as the tooth can be directed upward and distally

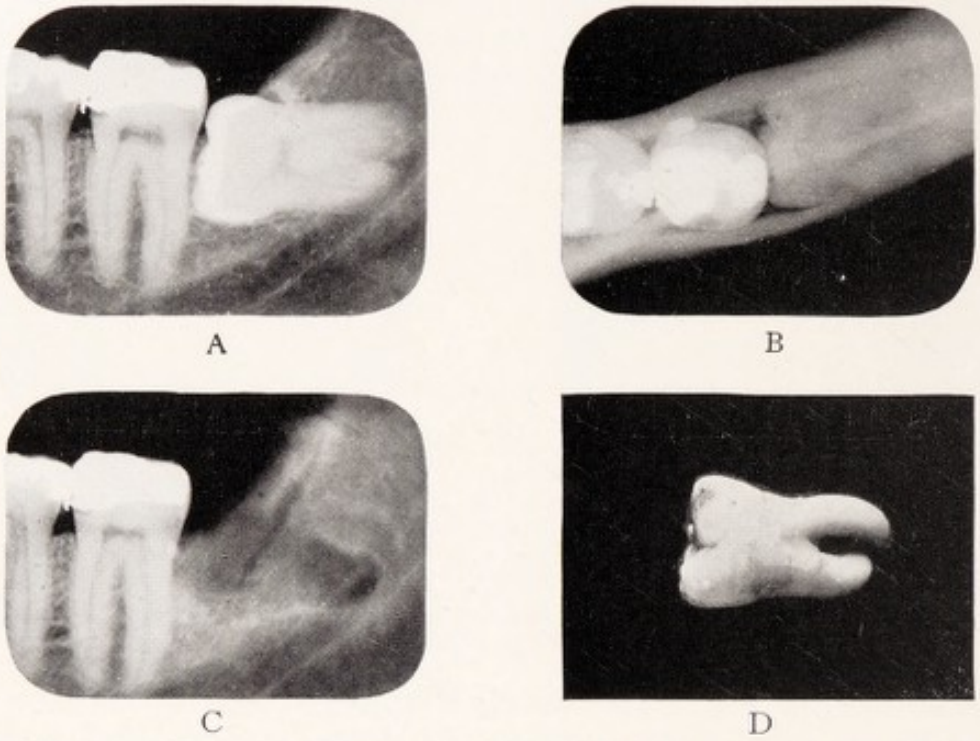


Fig. 699. — Horizontal Impaction—Buccal Deflection—Mesial Surface Inaccessible. Same case. *A*, lingual radiogram; *B*, occlusal radiogram; *C*, socket after extraction; *D*, extracted tooth.

by the application of an exolever to the mesial surface to a distance where the superior border of the ossistructure along the buccal surface can be used as a fulcrum. The presence of ossistructure between the occlusal surface of the third molar and the distal surface of the distal root of the second has interfered with the progress of the third molar toward the second, which condition prevents the showing of an overlap on the distobuccal surface of the second molar. This ossistructure is not excised between the lingual half of the occlusal surface of the third molar and the buccal half of the distal surface of the second on account of the limited space, but on that part of the occlusal surface that is out of alignment buccally with the distobuccal surface of the second molar.

In Fig. 699 B is shown an occlusal radiogram of the case where a part of the occlusal surface is out of alignment buccally with the distobuccal surface of the second molar. This is a type of case where no dependence can be placed on a lingual radiogram to show a buccal deflection, but an occlusal radiogram will detail the condition. In Fig. 699 C is shown the socket after extraction, and in Fig. 699 D is shown the extracted tooth.

In the case shown in Fig. 700 A the mesial root is inclined distally and the distal root is straight. The ossistructure on the distal surface extends to the gingival third and is excised slightly distal to this point on account of the character of the root formation. Excision is made

A B

Fig. 700. — Horizontal Impaction—Buccal Deflection—Mesial Surface Inaccessible. Same case. *A*, mesial root inclined distally and distal root straight, with ossistructure on distal surface extending to gingival third and over greater part of lingual and buccal surfaces; *B*, case after extraction.

over that part of the occlusal surface that is out of alignment buccally with the distobuccal surface of the second molar from the superior border to the mesial surface.

When the exolever is adjusted to the mesial surface to direct the tooth upward and distally, the second molar is liable to be disturbed if the exolever movements are not cautiously made, as the interseptum between the first and second molars is involved slightly by a pathologic condition. Figure 700 B shows the case after extraction.

LINGUAL DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

A case is not frequently encountered in practice in which the buccal surface of the third molar is deflected to a slight extent out of alignment lingually with the corresponding surface of the second and the occlusal surface of the third molar is deflected to a slight extent lingually, with the mesial surface of the latter tooth accessible to the immediate application of the exolever.

CLINICAL EXAMINATION

Exposed Crown.—Parts of the occlusal and distal surfaces may be exposed through the gum tissue, and when exposed, the operator

should determine the extent of the lingual deflection of the buccal surface of the third molar from the alignment of the corresponding surface of the second.

Gum Tissue.—The description above in regard to the exposed crown will apply to the condition of the gum tissue.

RADIOGRAPHIC INTERPRETATION

Crown.—A part of the occlusal surface is visible, and the first and second molars show well-defined enamel caps and pulp chambers, with no part of the occlusal surfaces of the latter teeth visible. There is no overlap of the occlusal surface of the third molar upon the distal surface of the second, and there is no overlap, at the contact point, of the first molar upon the second. This interpretation indicates a lingual deflection.

Roots.—The root formation that may be defined in this class of impaction and its incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root straight, 2, and mesial root inclined distally and distal root mesially, 1.

Ossistructure.—The ossistructure on the distal surface does not usually extend beyond the gingival third. A part of the buccal surface is, as a rule, free of ossistructure, and pathologic changes usually involve the ossistructure below the mesial surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—The occlusal surface of the third molar is deflected lingually, and the buccal surface is deflected out of alignment lingually with the corresponding surface of the second. If the extent of the deflection can be determined by the part of the crown exposed or by palpation, the first incision is made distally, the buccal surface being followed to a point that will permit excision on the distal surface when such a procedure is indicated. If, however, this course cannot be followed, an incision is made on the buccal half of the distal surface of the second molar. When the buccal surface of the third molar is located, an incision is then made following the latter surface distally. An incision along the entire distal surface of the second molar will permit access of the ossisector and exolever to the mesial surface of the third molar without injuring the gum tissue. The incision is similar to that illustrated in Fig. 704, page 681, where the gum tissue extends over the entire tooth.

Ossistructure Technic—Distal Excision.—The ossistructure on the distal surface, on account of the character of the root formation, is excised to a slight extent to decrease any resistance. The gum tissue

on the distal surface is displaced with the back of the blade, and with the blade in alignment with this surface, with pressure under control, the ossistructure is excised, but no excision on the mesial or buccal surface is indicated. The excision is made as described on page 625.

Exolever Technic—Mesial Application.—As the pathologic involvement below the mesial surface is usually extensive, exolever No. 2L or 3L for the left side or No. 2R or 3R for the right side is selected, and the alignment of the buccal surface is determined when the clinical examination or incision of the gum tissue is made. The flat side of the blade is sent down on the buccal surface and the gum tissue on this surface is displaced with the back of the blade, when the point is directed under the mesial surface as far as the space below this surface

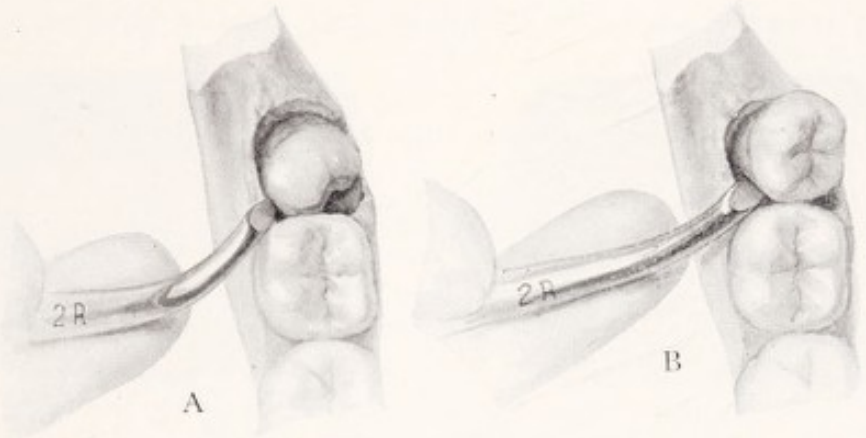


Fig. 701. — Mesial Application of Exolever — Horizontal Impaction — Lingual Deflection—Mesial Surface Accessible. *A*, exolever No. 2R applied to buccal surface; *B*, handle directed buccally in order to adjust blade below mesial surface and direct tooth upward.

will permit. The flat side of the blade is adjusted to the mesial surface and the round side engages the ossistructure along the buccal surface as a fulcrum, when the handle of the exolever is directed downward, which movement will loosen the tooth and direct it upward (Fig. 701). This movement is followed when the crown has cleared the distal surface of the second molar by the handle being turned mesially or distally and the tooth being raised out of its socket. If the fulcrum is lost, the exolever is sent farther distally between the mesial surface and the ossistructure below this surface, when the handle of the exolever is turned mesially, by which movement the tooth will be raised out of its socket.

SUMMARY OF CASES

In the cases shown in Fig. 702, where the mesial root is inclined distally and the distal root is straight, excision of the ossistructure on the distal surface is indicated to decrease the resistance of the root

formation. An exolever is selected with a blade slightly larger than the space between the mesial surface and the ossistructure below this surface, which is extensively involved by a pathologic condition. The application of the exolever and subsequent movements should be made with precision, and the initial application should, if possible, be final, as repeated applications will complicate the case by breaking down further the involved ossistructure below the mesial surface. Where a larger blade is indicated, the fulcrum will not be a good one, and the blade is directed on the mesial surface as far distally as the superior border of the ossistructure along the buccal surface will permit.

In an occasional case where the buccal surface is deflected out of alignment lingually with the corresponding surface of the second molar the occlusal surface is not directed lingually, and the entire surface will be in contact with the distal surface of the second molar and

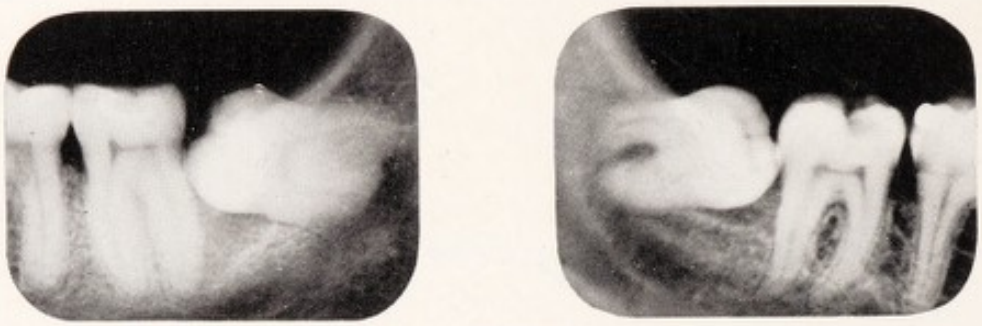


Fig. 702. — Horizontal Impaction — Lingual Deflection — Mesial Surface Accessible. Mesial root inclined distally and distal root straight. The ossistructure on distal surface extends to gingival third, with extensive pathologic condition below mesial surface, and part of lingual and buccal surfaces free of ossistructure.

cannot be differentiated from a case of horizontal impaction where there is no deflection except by an occlusal radiogram. The incision of the gum tissue is made distally in alignment with the buccal surface and along the buccal half of the distal surface of the second molar (Fig. 703 A). The gum tissue on the distal surface is displaced with the back of the blade of ossisector No. 2L or 4L for the left side or No. 2R or 4R for the right side and the excision is made toward the distal surface (Fig. 703 B). The gum tissue on the buccal surface is displaced with the back of exolever blade No. 2L or 2R, and the blade is directed downward on this surface (Fig. 703 C). When the mesial surface has been reached, the handle is directed buccally in order that the blade may be applied below the mesial surface (Fig. 703 D) to direct the tooth upward and distally. When the occlusal surface has cleared the distal surface of the second molar, the handle is turned mesially or distally to direct the tooth out of its socket (Fig. 703 E). As soon as the tooth has cleared the distal surface, where both roots are straight, a buccal application is then made.

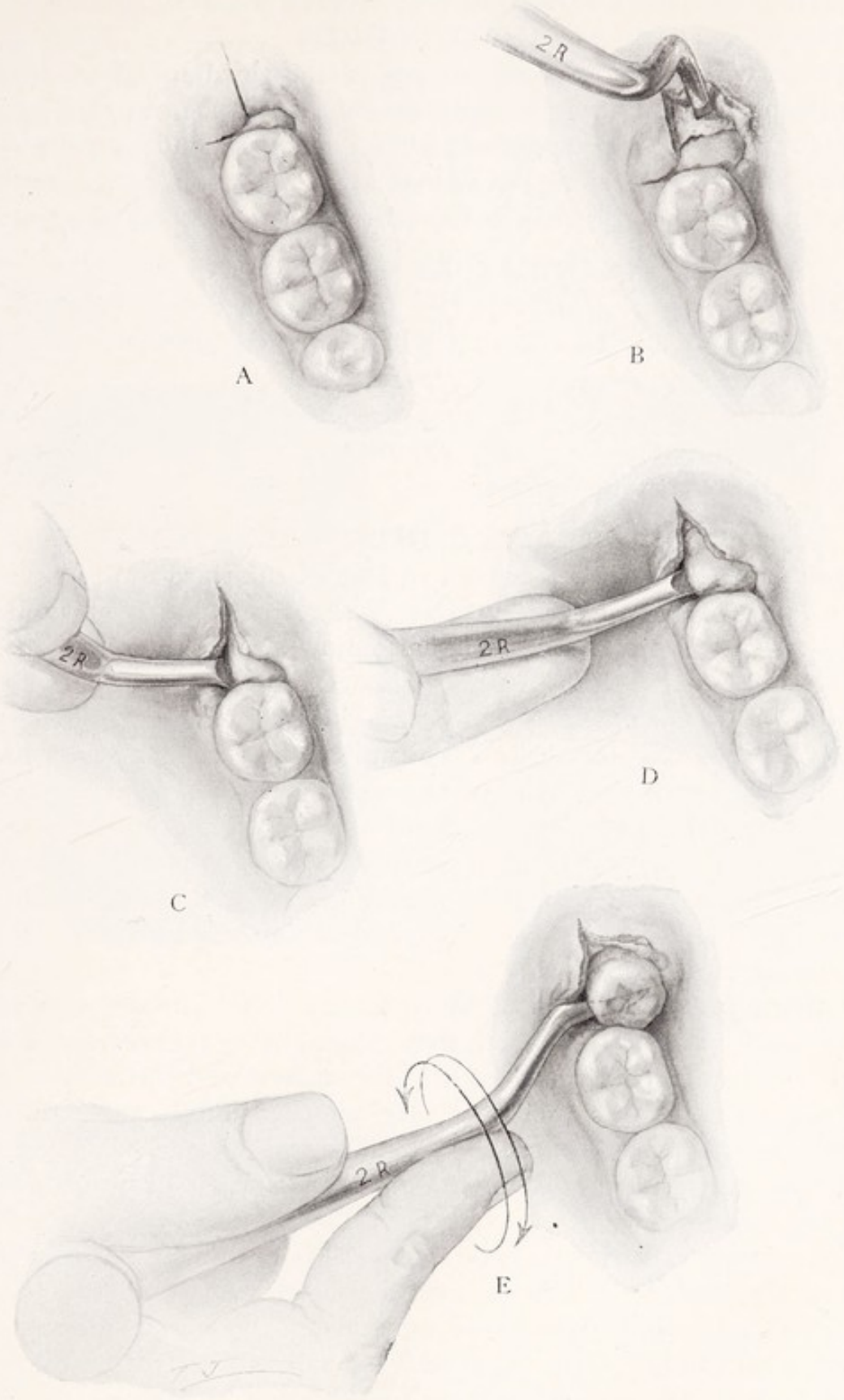


Fig. 703.—Horizontal Impaction—Lingual Deflection of Buccal Surface. *A*, incision of gum tissue; *B*, ossisector blade displacing gum tissue over distal surface; *C*, exolever displacing gum tissue and applied to buccal surface; *D*, blade of exolever directed below mesial surface; *E*, tooth directed out of socket by turning handle mesially or distally after crown has cleared distal surface of second molar.

LINGUAL DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

A case where the occlusal surface of the third molar is deflected to a slight extent lingually, with the buccal surface out of alignment lingually with the corresponding surface of the second, and the mesial surface is inaccessible to the immediate application of the exolever, does not occur so frequently as the other types of horizontal impaction.

CLINICAL EXAMINATION

Exposed Crown.—Rarely is any part of the crown exposed, but, should there be any exposure, it will be a small part of the occlusal or distal surface.

Gum Tissue.—Usually the gum tissue covers the greater part of the crown, but if there is any exposure, it will be a small part of the occlusal or distal surface.

RADIOGRAPHIC INTERPRETATION

Crown.—A part of the occlusal surface of the third molar is visible, but no part of the occlusal surfaces of the first and second molars is shown. The first and second molars show definite enamel caps and pulp chambers, and there is a normal contact between these teeth, but no overlap is shown.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root straight, 10; fused roots, 5; mesial root inclined distally and distal root inclined mesially, 2; mesial root straight and distal root inclined mesially, 2; partially developed roots, 2, and both roots straight, 1.

Ossistructure.—The ossistructure on the distal surface usually extends to the gingival third, or it may extend beyond that point toward the occlusal surface, but a case where the entire distal surface is covered by ossistructure is seldom seen. In an occasional case pathologic changes involve the ossistructure on the distal surface. The superior border of the ossistructure on the buccal surface is examined, and it will be found that, when the superior border extends beyond the mesial surface, the latter surface will be inaccessible to the immediate application of the exolever. The distance between the mesial surface and the superior border is determined to ascertain the extent of excision to be made on the buccal surface. Occasionally there will be ossistructure between the occlusal surface of the third molar and the distal surface of the distal root of the second, and excision of this ossistructure, in addition to such other excision as may be indicated, is made in advance of the application of the exolever.

OPERATIVE TECHNIC

Gum Tissue Technic.—The extent to which the buccal surface of the third molar is deflected out of alignment lingually with the corresponding surface of the second molar will govern the angle of approach with the ossisector for excision of the ossistructure on the buccal surface. If the buccal surface can be located by palpation, the incision is made distally, and follows the buccal surface. If, however, the buccal surface cannot be located by palpation, it may be anywhere from a slight distance lingual to the distobuccal surface of the second molar to a point midway between the buccal and lingual surfaces of the

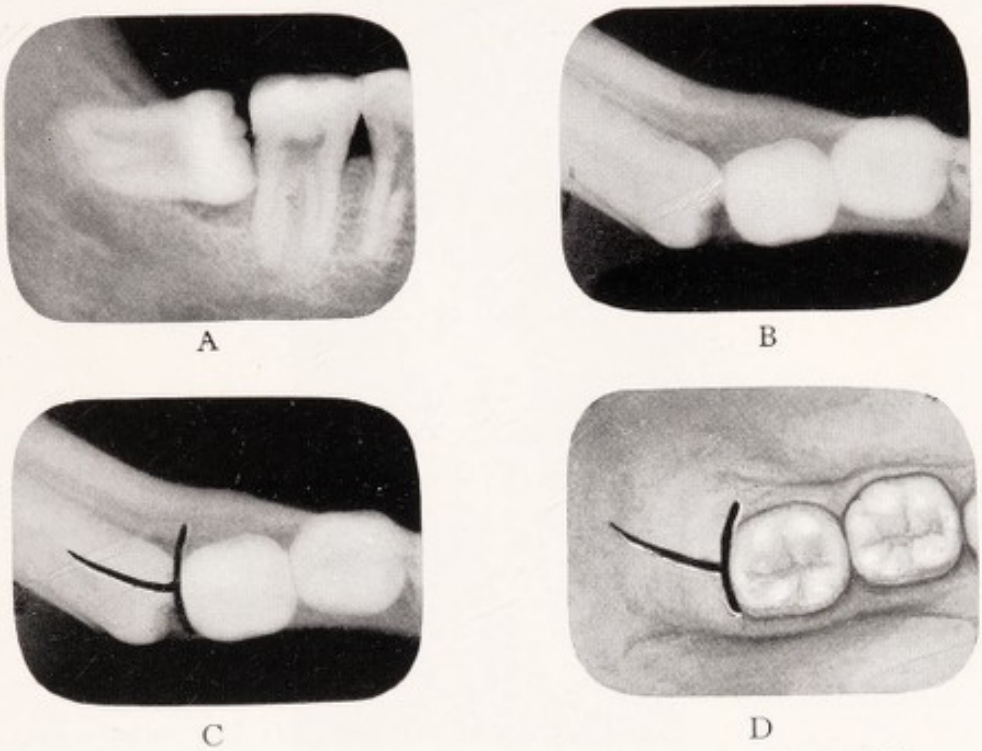


Fig. 704. — Gum Tissue Technic — Horizontal Impaction—Lingual Deflection—Mesial Surface Inaccessible. *A*, radiogram of a lingual deflection; *B*, occlusal view of same case; *C*, incision made downward and buccally along buccal half of distal surface of second molar and on lingual half of distal surface of second molar, distally along center of distal surface; *D*, occlusal view.

second molar. Where the buccal surface cannot be determined clinically, the gum tissue on the entire distal surface of the second molar is incised, when the lancet can be used to determine the location of the buccal surface, after which the incision is made distally along the buccal surface to a point where the ossistructure on the distal surface can be excised.

In Fig. 704 are shown lingual and occlusal radiograms of a case where the incision has been determined from the radiographic interpretation.

Ossistructure Technic—Distal Excision.—When excising the ossistructure on the distal surface, the lingual deflection of the tooth should

be borne in mind. Ossisector No. 2L or 4L for the left side or No. 2R or 4R for the right side is selected for this excision, and as the ossistructure is usually not very dense on this surface, the excision is not, as a rule, difficult to execute, provided it is in alignment with the distal surface. The gum tissue on the distal surface is displaced with the back of the blade, and the blade is directed with pressure toward the distal surface for the purpose of excision if such a procedure is indicated by the radiogram, as described on page 639.

Buccal Excision.—A pathologic condition frequently involves the area below the mesial surface, but no dependence should be placed on

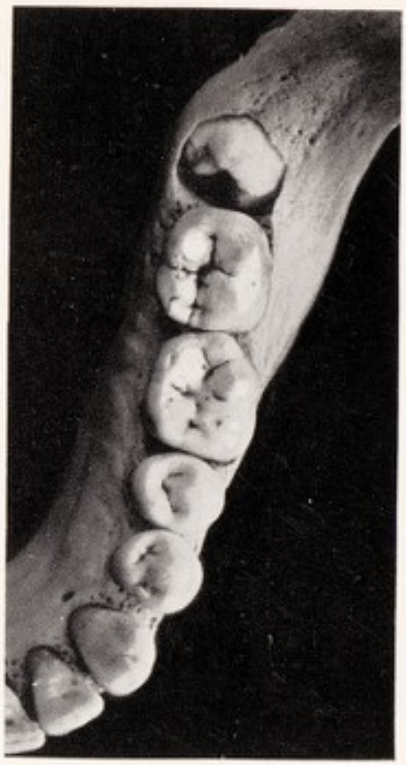


Fig. 705. — Horizontal Impaction — Lingual Deflection — Mesial Surface Inaccessible. Mandible showing space between buccal surface of impacted mandibular third molar and ossistructure along this surface.

this condition as an aid for the adjustment of the exolever to the mesial surface without excision of the ossistructure on the buccal surface.

As is the case where the buccal surface of the third molar is in alignment with the corresponding surface of the second molar and the mesial surface is inaccessible, there is usually a space between the buccal surface and the ossistructure on this surface (Fig. 705). Ossisector No. 6L, 6R; No. 10L, 10R; No. 11L, 11R is indicated. The blade is directed downward, in alignment with the buccal surface, toward the mesial surface with the expectation that there will be a space which will allow the blade to be inserted between the buccal surface and the ossistructure on this surface. If, however, there is no such space, excision is made from the superior border of the ossistructure

down to a short distance above the mesial surface, and, as the ossistructure is usually not very dense, it will not be difficult to make this excision (Fig. 706). The lingual deflection of the third molar and the extent to which the buccal surface is displaced out of alignment lingually with the corresponding surface of the second should be borne in mind, and excision is confined to the buccal surface.

Occlusal Excision.—Where there is ossistructure between the occlusal surface of the third molar and the distal surface of the distal root of the second, ossisector No. 2L or 11L for the left side or No. 2R or 11R for the right side is selected. The gum tissue over the occlusal surface is displaced with the back of the blade, and the blade is inserted

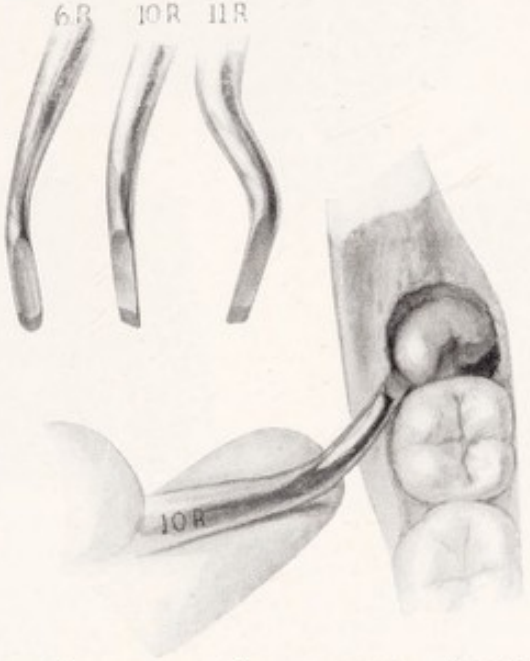


Fig. 706.—Buccal Excision of Ossistructure—Horizontal Impaction—Lingual Deflection—Mesial Surface Inaccessible. Ossisector No. 10R applied for excision in alignment with buccal surface.

between the occlusal surface of the third molar and the distal surface of the distal root of the second (Figs. 707 A and 707 B). The ossistructure between the two points mentioned, starting at the superior border, is fractured away, the blade being kept as closely as possible to the occlusal surface, and all the ossistructure in this region is excised before any attempt is made to apply the exolever to the mesial surface. The intervening space varies in size, and care should be taken not to mar the distal surface of the second molar.

Where the ossistructure extends over the linguoclusal surface, excision is made by directing the blade of ossisector No. 11L or 11R, with pressure under control, between the occlusal surface and the ossistructure over the linguoclusal surface (Fig. 707 C). As a space is usually present, which permits the instrument to be applied, no difficulty will be encountered when making this excision.

Exolever Technic—Mesial Application.—The alignment of the buccal surface having been determined when excising the ossistructure on this surface, exolever No. 2L for the left side or No. 2R for the right side is selected, and the gum tissue on the buccal surface is displaced with the back of the blade. The blade is kept as nearly as possible in a vertical position and in alignment with the buccal surface until it reaches the mesial surface. The handle of the exolever is then directed buccally to send the blade under the mesial surface, after which

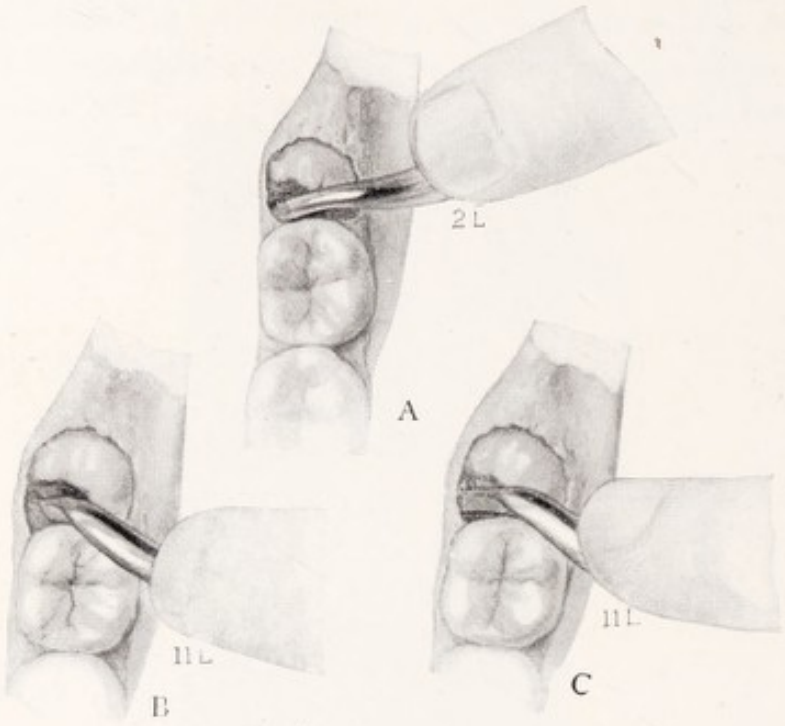


Fig. 707. — Occlusal Excision of Ossistructure — Horizontal Impaction — Lingual Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 2L applied for excision between occlusal surface of third molar and distal surface of second; *B*, ossisector No. 11L applied for excision; *C*, ossisector No. 11L applied for excision over linguoclusal surface.

the handle is directed downward and the tooth upward, and, when the tooth has cleared the distal surface of the second molar the handle is turned mesially or distally, as described on page 677. Usually, on turning the handle mesially, the fulcrum is lost, and exolever No. 3L for the left side or No. 3R for the right side, with a larger blade, is adjusted to the mesial surface, when the exolever movement is repeated, as may be necessary until the tooth has been directed out of its socket. During the execution of the exolever technic, care should be taken not to exert any pressure lingually, as there is a liability of directing the tooth into the soft tissue on the lingual side.

SUMMARY OF CASES

In the case shown in Fig. 708 A, where the mesial root is inclined distally and the distal root is straight, the ossistructure on the distal surface extends up to the gingival third and very little excision is indi-

cated. A pathologic condition frequently involves the ossistructure below the mesial surface, but excision of the ossistructure on the buccal surface is made, as there is usually enough ossistructure on this surface from the superior border down to the mesial surface to interfere with the immediate application of the exolever. Excision between the occlusal surface of the third molar and the distal surface of the distal

A

B

C

Fig. 708. — Horizontal Impaction — Lingual Deflection — Mesial Surface Inaccessible. Same case. *A*, mesial root inclined distally and distal root straight, with ossistructure on distal surface extending to gingival third and over greater part of lingual and buccal surfaces; *B*, socket after extraction, lingual view; *C*, socket after extraction, occlusal view.

root of the second is also indicated. Where the mesial root is inclined distally and the distal root is inclined mesially, the condition is unfavorable for executing the exolever technic. Figure 708 B shows socket after extraction, lingual view, and Fig. 708 C shows socket after extraction, occlusal view.

In the cases shown in Fig. 709, where the mesial root is inclined

Fig. 709. — Horizontal Impaction — Lingual Deflection — Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially. The ossistructure on distal surface extends slightly beyond gingival third and over greater part of lingual and buccal surfaces.

distally and the distal root is inclined mesially, there will be considerable resistance encountered in the execution of the exolever technic. The ossistructure on the distal surface extends slightly beyond the gingival third and is excised quite a distance beyond this point. Excision is indicated on the buccal surface to gain access to the mesial surface. Excision is also indicated between the occlusal surface of the third molar and the distal surface of the distal root of the second. When executing the exolever technic considerable pressure must be applied in order to fracture the septum between the roots when directing the tooth upward and distally.

In the case shown in Fig. 710 A the mesial root is straight and the distal root is inclined to a slight extent mesially at the apical third. The ossistructure on the distal surface extends slightly beyond the gingival third, and excision on this surface is indicated distally beyond this point. The ossistructure below the mesial surface is affected

A B

Fig. 710. — Horizontal Impaction — Lingual Deflection — Mesial Surface Inaccessible. Same case. *A*, mesial root straight and distal root inclined to slight extent mesially at apical third, with ossistructure on distal surface extending slightly beyond gingival third and over greater part of lingual and buccal surfaces; *B*, occlusal view, showing alignment of third molar compared with second.

by a pathologic condition, and the affection may extend up to the buccal surface, but excision on this surface is necessary in order to reach the mesial surface. Excision between the occlusal surface of the third molar and the distal surface of the distal root of the second is also indicated. The condition of the involved ossistructure below the mesial surface indicates that this structure should not be broken down further by repeated applications of the exolever when directing the tooth upward and distally out of its socket. Figure 710 B is an occlusal view of the case.

In the cases shown in Fig. 711, where the mesial root is inclined distally and the distal root is straight, the ossistructure extends on distal surface slightly beyond the gingival third, and extensive excision is indicated. The ossistructure on the distal surface having been excised, the operator should not fail to observe the ossistructure between the occlusal surface of the third molar and the distal surface of the distal root of the second. If an attempt is made to apply the exolever to the

mesial surface without excising this ossistructure, there will be an unusual amount of resistance, which may defeat the intended purpose. Excision on the buccal surface from the superior border of the ossistructure down to a short distance above the mesial surface is indicated. On account of the distance between the mesial surface and the superior border of the ossistructure along the buccal surface, the blade of the exolever should be of sufficient length to reach the mesial surface in order to direct the tooth up to the superior border for the reapplication of the exolever and to permit the ossistructure along the buccal surface to be used as a fulcrum.

Fig. 711. — Horizontal Impaction — Lingual Deflection — Mesial Surface Inaccessible. Mesial root inclined distally and distal root straight. There is ossistructure between occlusal surface of third molar and distal root of second. The ossistructure on distal surface extends slightly beyond gingival third and over entire lingual and buccal surfaces.

In the case shown in Fig. 712 A the roots are fused. The ossistructure on the distal surface extends to the gingival third and no excision is indicated. The ossistructure below the mesial surface is affected by

A

B

C

Fig. 712. — Horizontal Impaction — Lingual Deflection — Mesial Surface Inaccessible. *A*, roots fused. The ossistructure on distal surface extends to gingival third and over greater part of lingual and buccal surfaces; *B*, occlusal view of case; *C*, socket after extraction

a pathologic condition, and the affection may extend up to the buccal surface, but excision on this surface is necessary in order to reach the mesial surface. The condition of the involved ossistructure below the mesial surface indicates that this structure should not be broken down further by repeated applications of the exolever when directing the tooth upward and distally out of its socket; Fig. 712 B is an occlusal view of the case, showing the location of the buccal surface of the third molar lingual to the buccal surface of the second and the part of the occlusal surface in contact with the distal surface of the second, also that part of the occlusal surface free of contact with the distal surface of the second; Fig. 712 C shows the socket after extraction.

BUCCOLINGUAL DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

The most common type of horizontal impaction of the mandibular third molar is where the occlusal surface is deflected to a slight extent lingually, with a part of the surface in contact with the distobuccal surface of the second molar, and where the buccal surface of the third molar is deflected to a slight extent buccally at right angle to the distobuccal surface of the second, with the mesial surface accessible or inaccessible to the immediate application of the exolever. Where the mesial surface is inaccessible, that part of the ossistructure on the buccal surface that is out of alignment buccally with the distobuccal surface of the second molar is excised to gain access to the mesial surface. Where the mesial surface is accessible, no excision is necessary to gain access to that part of the mesial surface that is deflected buccally out of alignment with the distobuccal surface of the second molar. The point of access, in most instances, is the result of a pathologic condition involving the ossistructure below the mesial surface of the third molar.

CLINICAL EXAMINATION

Exposed Crown.—A part or the whole of the distoclusal surface and also a part of the buccal surface may be exposed. Occasionally the entire crown is covered by gum tissue.

Gum Tissue.—The gum tissue on the distal surface usually extends to and sometimes beyond the gingival third.

RADIOGRAPHIC INTERPRETATION

Crown.—A part of the occlusal surface is visible, but the extent to which it is visible varies, and the condition should be compared with the occlusal surfaces of the first and second molars, which show no part of these surfaces, but present definite enamel caps and

pulp chambers. There is an overlap of the occlusal surface of the third molar upon the distobuccal surface of the second. The contact point between the first and second molars shows no overlap, which verifies a buccal deflection, and these two diagnostic points indicate a buccolingual deflection of the third molar. The mesial surface of the third molar is usually at the gingival third of the second, and the distal surface of the third molar may be in alignment with, above or below the occlusal surface of the second.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: both roots inclined distally, 5; mesial root inclined distally and distal root straight, 5; fused roots, 5; mesial root straight and distal root inclined mesially, 4; both roots straight, 3; mesial root inclined distally and distal root inclined mesially, 2; partially developed roots, 2, and divergent roots, 2.

Ossistructure.—The ossistructure on the distal surface usually extends beyond the gingival third, and the ossistructure below the mesial surface is involved by a pathologic condition to an extent to allow the application of the exolever to this surface without interference. The extent to which pathologic changes have involved the distal root of the second molar should be observed. The greater part of the buccal surface is free of ossistructure.

OPERATIVE TECHNIC

Gum Tissue Technic.—As parts of the distal, buccal and occlusal surfaces are usually exposed, the operator will be able to determine the alignment of the buccal surface of the third molar with the corresponding surface of the second, which alignment extends at a right angle buccally, varying from the bifurcation on the buccal surface of the second molar or posteriorly to the bifurcation. The incision of the gum tissue is started at that part of the buccal surface where the occlusal surface of the third molar is in contact with the distobuccal surface of the second, and is extended downward and to a slight extent buccally. A second incision is made from the distobuccal surface of the second molar distally, or from the exposed part of the buccal surface along the buccal surface, or about in the center of the distal surface to a point that will permit excision of the ossistructure on the distal surface so that no interference will be encountered when the tooth is directed upward and distally (Fig. 713). A third incision is made, when indicated, along the distobuccal surface of the second molar in order to displace the tissue at this point. Where no part of the tooth is exposed, the incision is made as described on page 699.

Ossistructure Technic—Distal Excision.—In the majority of cases no excision on the distal surface is indicated. Where the roots are, however, extremely long or markedly divergent, excision is made on the distal surface to decrease resistance, ossisector No. 2L or 4L for the left side or No. 2R or 4R for the right side being selected. When excising the ossistructure on this surface, the ossisector follows the alignment of the distal surface, as illustrated in Fig. 720 D, page 699, and Figs. 721 C, 721 D, page 700, and the excision is executed as described on page 701. No excision will be necessary on the buccal surface or below the mesial surface, as the involvement of the ossi-

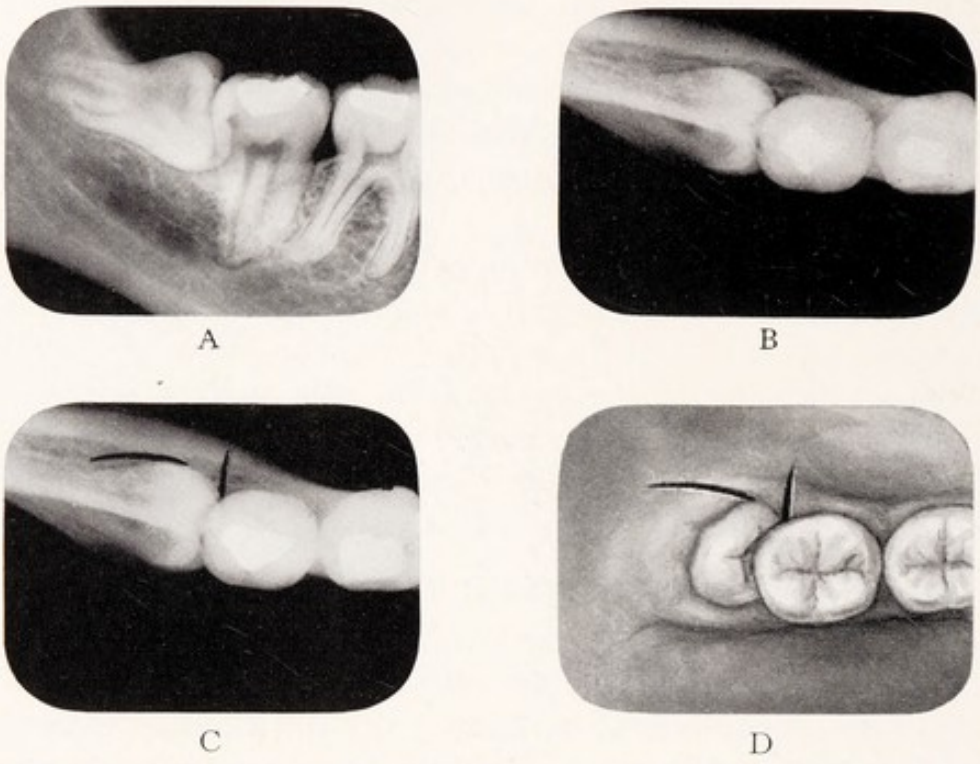


Fig. 713. — Gum Tissue Technic—Horizontal Impaction—Buccolingual Deflection—Mesial Surface Accessible. *A*, radiogram of buccolingual deflection where part of crown is exposed; *B*, occlusal view of same case; *C*, incision made buccally and downward where mesioclusal surface is in contact with distobuccal surface of second molar, and distally along buccal surface; *D*, occlusal view.

structure will permit access of the exolever below the mesial surface. The extent of destruction below the mesial surface often complicates the use of the exolever on account of the distance of the mesial surface to the ossistructure below this surface, and the extent of ossistructure destroyed will indicate the size of exolever blade to be selected.

Exolever Technic—Mesial Application.—When the incision of the gum tissue on the buccal surface and the clinical examination have been made, the alignment of the buccal surface of the third molar with the corresponding surface of the second is determined. The extent of pathologic involvement below the mesial surface and the available amount of mesial surface free of ossistructure should be

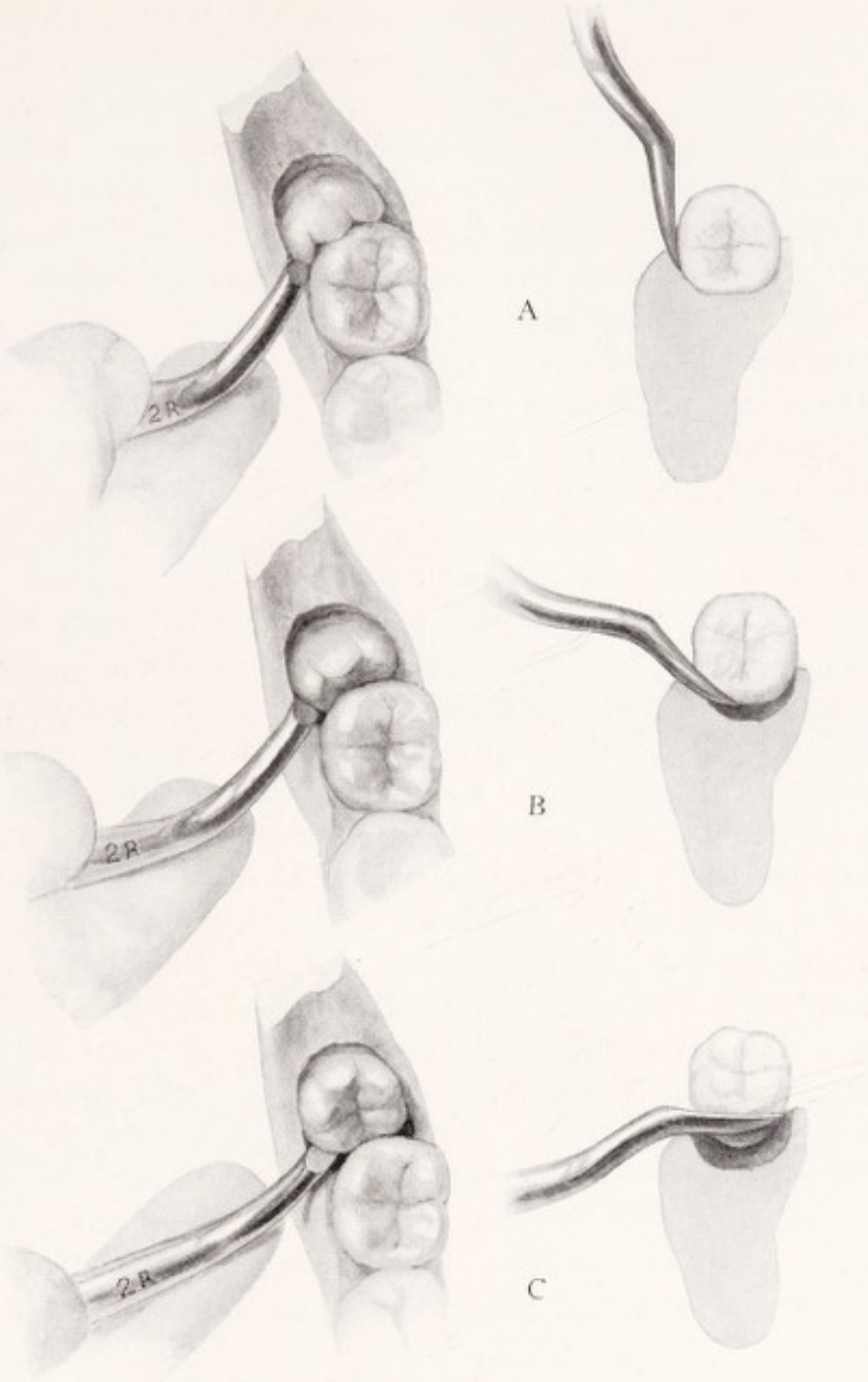


Fig. 714. — Mesial Application of Exolever — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Accessible. *A*, application of exolever No. 2R in alignment with buccal surface, viewed from occlusal, also a frontal section; *B*, handle directed buccally and downward, blade engaging mesial surface and ossistructure along mesiobuccal surface as a fulcrum, and tooth directed partially upward, viewed from occlusal and shown in frontal section; *C*, blade directed farther under mesial surface, handle pressed downward to a greater extent and occlusal surface cleared distobuccal surface of second molar, viewed from occlusal and from a frontal section.

observed in the radiogram, and exolever No. 2L, 2R; No. 3L, 3R; No. 4L, 4R; No. 5L, 5R; or No. 7L, 7R is selected, dependence being placed on the preliminary examination. The gum tissue on the buccal surface is displaced with the back of the blade, and the flat side of the blade is applied to the buccal surface, the blade being kept

in vertical alignment with this surface, which is at an angle to the distobuccal surface of the second molar (Fig. 714 A). The blade is sent down on the buccal surface of the third molar until the mesial surface has been reached, the handle being directed buccally, when the point of the blade is inserted underneath the mesial surface, with the flat side adjusted to this surface and the round side resting upon the ossistructure along the mesiobuccal surface, when the handle is pressed downward (Fig. 714 B).

Where there is extensive pathologic involvement, the exolever movements are made downward with considerable force with the object of making the initial movement final. If, however, by this movement the tooth has been only partially raised out of its socket, the blade is directed farther along the mesial surface (Fig. 714 C), and when a secure fulcrum has been obtained, the exolever movements are repeated until the tooth has been extracted. If during the application of the exolever to the mesial surface the fulcrum is lost, a larger blade to fit the increased space is used. During the application of the exolever the superior border of the ossistructure along the mesiobuccal surface is used as a fulcrum, as no dependence can be placed on the ossistructure below the mesial surface, and often the necessary support is obtained at the external oblique ridge. The occlusal surface of the third molar, when in contact with the distobuccal surface of the second, will not interfere with an exolever movement upward. With the blade adjusted to the mesial surface, a lingual movement will force the occlusal surface of the third molar against the distobuccal surface of the second and loosen or dislodge the latter tooth. Precaution to avoid this incident should be observed during the execution of the exolever movements, and no pressure should be exerted in the direction of the second molar. When the tooth has cleared the distobuccal surface of the second molar, a mesial or distal movement with the exolever may then be executed.

Mesiobuccal Application.—Where the greater part of the buccal surface is free of ossistructure, or, in that type of a case where the structure along the mesial surface has been involved by a pathologic condition to the extent that a suitable fulcrum is not available, there is usually sufficient space to permit exolever No. 7L, 7R to be applied along the mesiobuccal surface. The back of the blade is used to displace the gum tissue over the buccal surface and the flat side directed downward toward the mesial surface. When the latter surface has been reached the handle is directed to a slight extent mesially and buccally, the blade being applied along the mesiobuccal surface (Fig. 715 A) and adjusted as far distally as the space will

permit along this surface. When the blade is wedged between the mesiobuccal surface and the ossistructure along this surface (Fig. 715 B) the wedge created is often sufficient to extract the tooth. If not, the handle is directed downward and the tooth upward (Fig. 715 C). Should the latter procedure fail to extract the tooth, the blade is directed farther distally along the mesiobuccal surface and the handle farther downward. When the tooth has been directed upward by this procedure to a distance where the occlusal surface

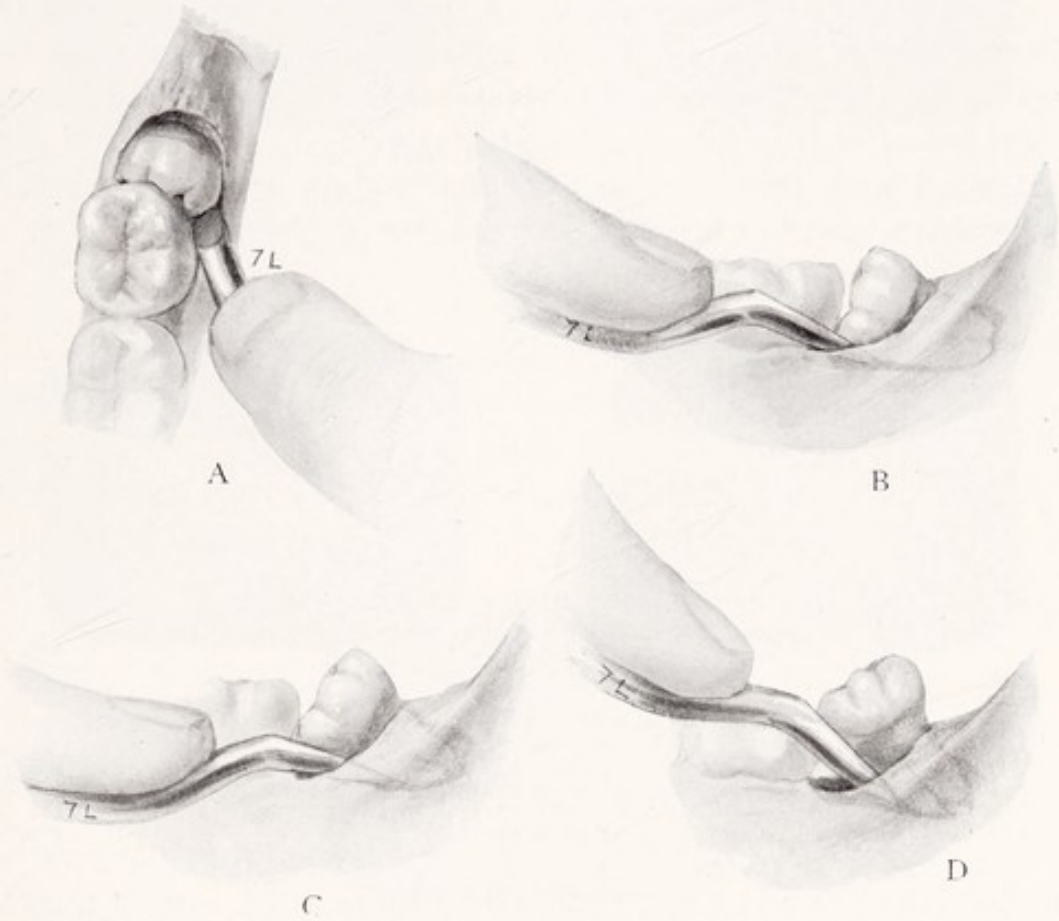


Fig. 715. — Mesiobuccal Application of Exolever—Horizontal Impaction—Buccolingual Deflection—Mesial Surface Accessible. *A*, exolever No. 7L applied to mesiobuccal surface; *B*, blade wedged between mesiobuccal surface and ossistructure along this surface; *C*, blade directed farther distally and handle downward; *D*, handle directed upward after tooth has cleared distobuccal surface of second molar.

has cleared the crown of the second molar, the handle is directed upward in order to complete the extraction (Fig. 715 D).

This type of case may be confused with a buccal deflection, where the buccal surface of the third molar is out of alignment with the corresponding surface of the second and the approach to the mesial surface is indicated along that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar. In the present case the occlusal surface of the third molar is inaccessible and usually impinges upon the distobuccal surface of

the second. The approach of the exolever is made at the buccal surface, which is at a right angle to the distobuccal surface of the second molar, to allow the exolever to be adjusted below the mesial or mesiobuccal surface.

SUMMARY OF CASES

In the case shown in Fig. 716 A, where the mesial root is inclined distally and the distal root is straight, with the ossistructure on the distal surface at the gingival third, excision on the distal surface is indicated to decrease resistance. A pathologic condition involves the ossistructure below the mesial surface, and, as the root formation indicates that resistance will be encountered when directing the tooth upward and distally, the adjustment and exolever movements should be executed with precision, so that unnecessary applications may be avoided and no further breaking down occur to the involved ossistructure below the mesial surface.

A B

Fig. 716. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Accessible. *A*, mesial root inclined distally and distal root straight, with ossistructure on distal surface extending to gingival third and over part of lingual and buccal surfaces; *B*, roots fused, with ossistructure on distal surface extending to gingival third. There is an extensive pathologic condition below mesial surface, and lingual and buccal surfaces free of ossistructure.

In the case shown in Fig. 716 B, where there is a fusion of the roots, no excision on the distal surface is indicated. Pathologic involvement below the mesial surface, however, is very extensive, and an extra large exolever blade should be adjusted. The operator need not hesitate to execute the exolever movements upward and distally with sufficient force to extract the tooth on the initial application.

In the cases shown in Fig. 717, where the mesial root is inclined distally and the distal root is inclined mesially, excision of the ossistructure on the distal surface is made to decrease the resistance. The initial application of the exolever is made with sufficient force to overcome the resistance of the roots. On account of the thinness of the ossistructure on the lingual surface, a small part of the lingual plate may be fractured. This incident may be avoided by inserting ossisector No. 2L for the left side or No. 2R for the right side between the lin-

gual surface and the ossistructure on this surface and fracturing away a small area at the bifurcation, as a direct excision cannot be made, and by this procedure possibly avoid the fracture of part of the lingual plate that may otherwise occur.

Fig. 717. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially, with ossistructure on distal surface extending to gingival third. A pathologic condition involves ossistructure below mesial surface, with greater part of lingual and buccal surfaces free of ossistructure.

In the case shown in Fig. 718, where the mesial root is straight and the distal root is inclined mesially at the apical third, a slight excision of the ossistructure on the distal surface is made on account of the mesial inclination of the distal root. In the execution of the exolever movements upward and distally the operator should have no fear of fracturing either root.

Fig. 718. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Accessible. Mesial root straight and distal root inclined mesially at apical third, with ossistructure on distal surface extending to gingival third. A pathologic condition involves ossistructure below mesial surface, with part of lingual and buccal surfaces free of ossistructure.

BUCCOLINGUAL DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

Where the third molar is impacted in a horizontal position, with a buccolingual deflection, the occlusal surface is deflected to a slight extent lingually and a part of this surface may be in contact with the distobuccal surface of the crown or the distal root of the second molar. The alignment of the buccal surface of the third molar is at an angle and buccal to the distobuccal surface of the second, and the superior border of the ossistructure on the buccal surface extends above the mesial surface of the third molar, presenting a type of im-

paction that requires careful judgment of the operator to determine, in advance of any operative procedure, the prognosis concerning the second molar. The exercise of judgment is necessary for the reason that, after the extraction of the impacted tooth, the gingival third of the second molar is exposed, and occasionally there is some disturbance of the peridental membrane from the pressure of the impacted tooth. In addition to this condition, the exposed root may be quite sensitive after the extraction. Experience has shown that most of these cases recover, as bone regeneration in the involved area usually takes place, again rendering the tooth serviceable.

The operator should observe carefully the second molar where the roots are of a conical shape and fused into a solid mass, or where a pathologic condition of the ossistructure involves the distal root, as any pressure applied to that tooth is liable to cause it to be loosened during the extraction of the third molar. The peridental membrane of the second molar should be observed, especially on the distal surface of the distal root, which is often involved, owing to the pressure of the impacted tooth, and in such a case it is questionable whether the second molar, after the extraction of the third, will be serviceable to the patient. It is advisable in such a case to make two or three radiograms to determine better the condition of the second molar.

Ascertaining the exact position of the tooth will avoid unnecessary excision. The excision is directed toward the buccal and distal surfaces, so that the exolever may be applied under the mesial surface and the exolever movements be made to direct the tooth upward and distally. Precaution should be taken to prevent the ossisector and exolever from coming in contact with the crown or distal root of the second molar. The occlusal surface of the first molar should be compared with the corresponding surface of the second and especially should this comparison be made where the crown of the third molar impinges upon the second in the region of the apical third of the distal root. The pressure of the third molar against the apical third of the distal root of the second has a tendency to force the latter tooth upward, so that the occlusal surface of this tooth will extend beyond the corresponding surface of the first molar. Where this condition prevails, it is usually sufficient evidence that the pressure of the third molar against the second has destroyed the latter tooth to such an extent that it will not be serviceable to the patient if the third molar is extracted, leaving the second molar *in situ*.

In addition to an examination of the occlusal surfaces of the first and second molars, the contact point between these teeth is examined, as the pressure of the occlusal surface of the third molar against the apical third of the second is often sufficient to cause the contact point

to be lost, and when this point is lost, an involvement of the interseptum between these teeth usually follows.

Where the interseptum between the first and second molars is extensively involved by a pathologic condition, the operator should determine the relationship between the occlusal surface of the third molar and the distal root of the second and judge the amount of ossistructure that will remain in the region of the second molar after the extraction of the third, as the amount of ossistructure necessary to support the second molar will indicate the probable value that can be attached to the latter tooth after such extraction. Where very little ossistructure remains to support the second molar in its position, it will in all probability be necessary to sacrifice this tooth.

CLINICAL EXAMINATION

Exposed Crown.—As a rule, no part of the crown is exposed; but, in case there is any exposure, it will be a part of the buccal or distoclusal surface, in which case the probe is used to determine the approximate alignment of the buccal surface of the third molar with the corresponding surface of the second. The extent to which the occlusal surface of the third molar is in contact with the distobuccal surface of the second is determined. It is not unusual, where the occlusal surface of the third molar impinges upon the distobuccal surface of the second, to find that the second molar is out of alignment lingually with the first molar. Where the alignment of the distal surface of the third molar is not very far below the alignment of the occlusal surface of the second, some idea of the alignment of the third molar can be obtained by palpating the gum tissue over the latter tooth.

Gum Tissue.—The gum tissue, as a rule, entirely covers the distal, buccal and lingual surfaces, but occasionally a small part of the crown may be exposed.

RADIOGRAPHIC INTERPRETATION

Crown.—A part of the occlusal surface of the third molar is visible, and the first and second molars show definite enamel caps and pulp chambers, but no part of their occlusal surfaces is visible. The lingual inclination of the tooth varies from a slight to a very marked degree. A part of the occlusal surface of the third molar is in contact with the distobuccal surface of the second in various degrees, indicated in the radiogram by the overlap of part of the occlusal surface of the third molar upon the distobuccal surface or distal root of the second; this can be checked by the normal contact between the first and second molars, which does not show an overlap. These

diagnostic points verify a buccolingual deflection of the third molar. The contact of the third molar with the second is usually at the gingival third, middle third or apical third of the distal root of the second molar. In some cases only a small part of the occlusal surface of the third molar is in contact with the distobuccal surface of the second, and in other cases the contact extends as far as the bifurcation on the buccal surface of the latter tooth.

Roots.—The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root inclined mesially, 25; fused roots, 22; mesial root inclined distally and distal root straight, 17; both

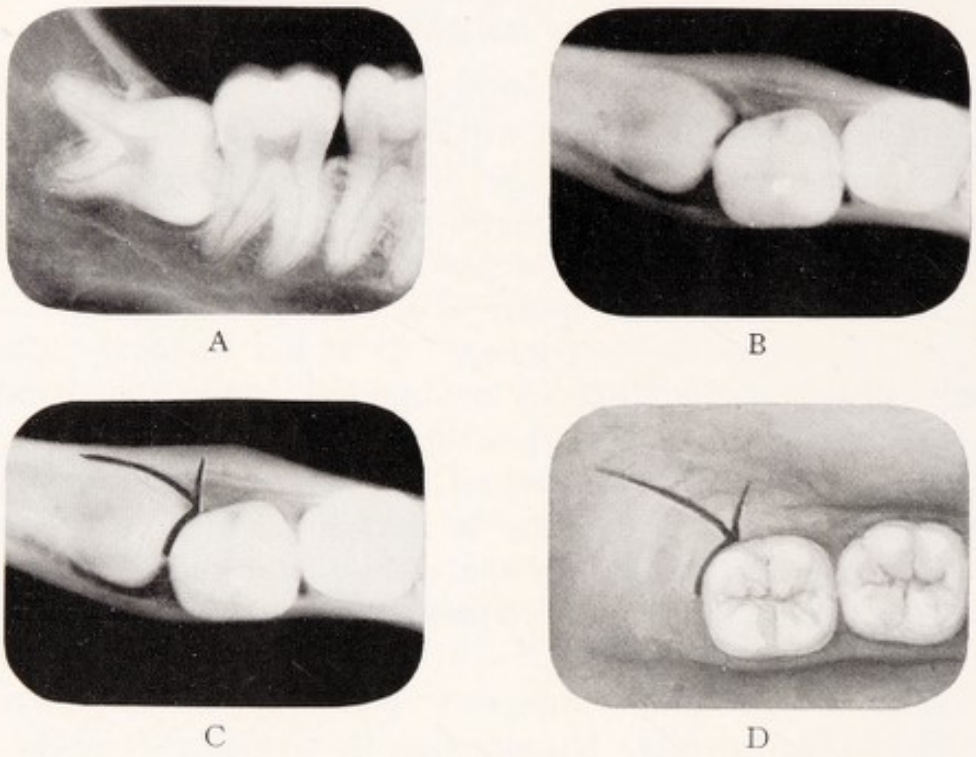


Fig. 719. — Gum Tissue Technic — Horizontal Impaction — Buccolingual Deflection—Mesial Surface Inaccessible. *A*, radiogram of a buccolingual deflection; *B*, occlusal view of same case; *C*, incision made buccally and downward where mesioclusal surface is in contact with distobuccal surface of second molar, and distally along buccal surface and on distobuccal surface of second molar; *D*, occlusal view.

roots straight, 12; mesial root straight and distal root inclined mesially, 9; both roots inclined distally, 7; partially developed roots, 5; both roots inclined mesially, 3, and divergent roots, 2.

Ossistructure.—The distal surface is often free of ossistructure down to the gingival third, but the tooth is seldom free of ossistructure distal to this point. The ossistructure more frequently extends from the gingival third toward the occlusal surface, and may extend over the entire surface. The mesial surface is inaccessible to the immediate application of the exolever. The superior border of

the ossistructure should be compared with the mesial surface to determine the extent of excision necessary on the buccal surface to gain access to the mesial surface. Where the entire crown is covered by ossistructure, it will extend over the entire lingual surface, and this condition should be considered when executing the exolever technic.

Mandibular Canal.—In extremely rare cases, where the mesial surface is at or below the apical third of the distal root of the second

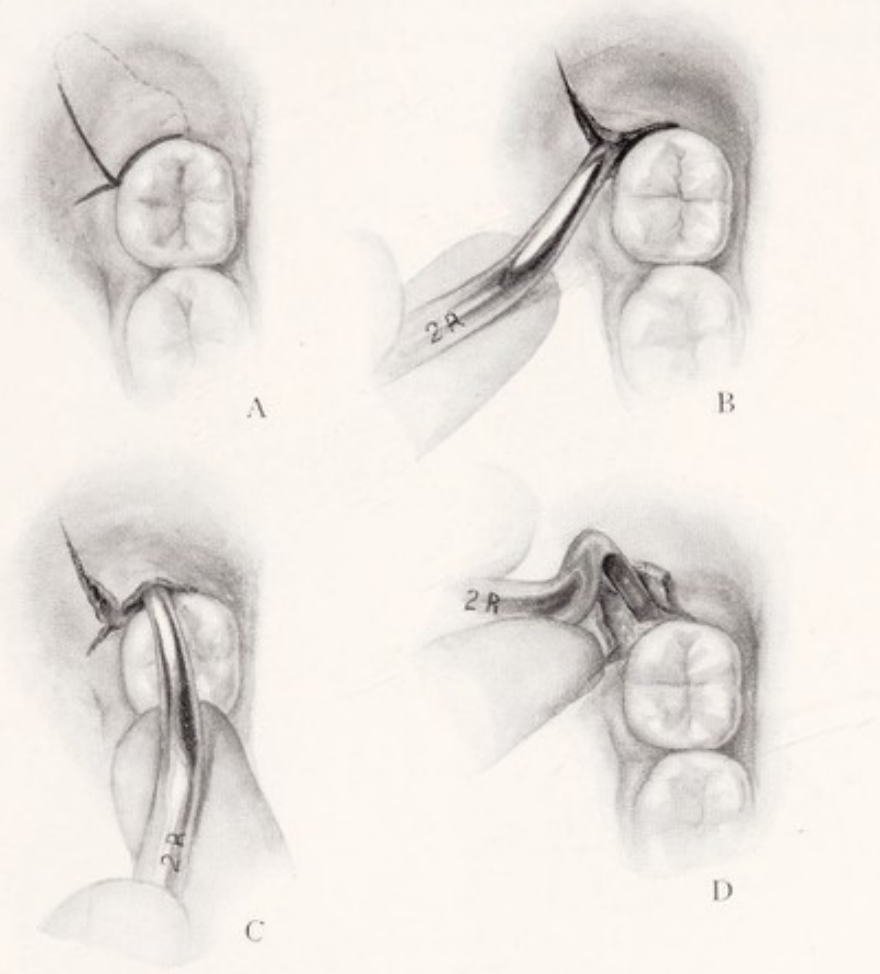


Fig. 720. — Displacing Gum Tissue — Distal Excision of Ossistructure — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. *A*, incision made; *B*, *C*, ossisector No. 2R displacing gum tissue; *D*, back of blade displacing gum tissue and directed toward ossistructure over distal surface.

molar, there may be a close relation between the mesial surface and the mandibular canal. This condition should be carefully observed in the radiogram, so that in the application of the exolever no injury will occur to the mandibular canal.

OPERATIVE TECHNIC

Gum Tissue Technic.—The incision of the gum tissue should be made as favorable as possible for access with the ossisector and exolever, so that when the blood clot fills the socket, the tissue will

close over the socket, preventing infection from entering and affecting the exposed part of the root that was in contact with the occlusal surface of the third molar. This precaution will also prevent infection of the exposed membrane and aid in the bone regeneration that is to follow.

An incision on the buccal surface of the second molar is made downward in line with that part of the occlusal surface of the third molar in contact with the distobuccal surface of the second, which is usually near the bifurcation of the second molar or slightly distal to the bifurcation, to a point that will permit access to the mesial

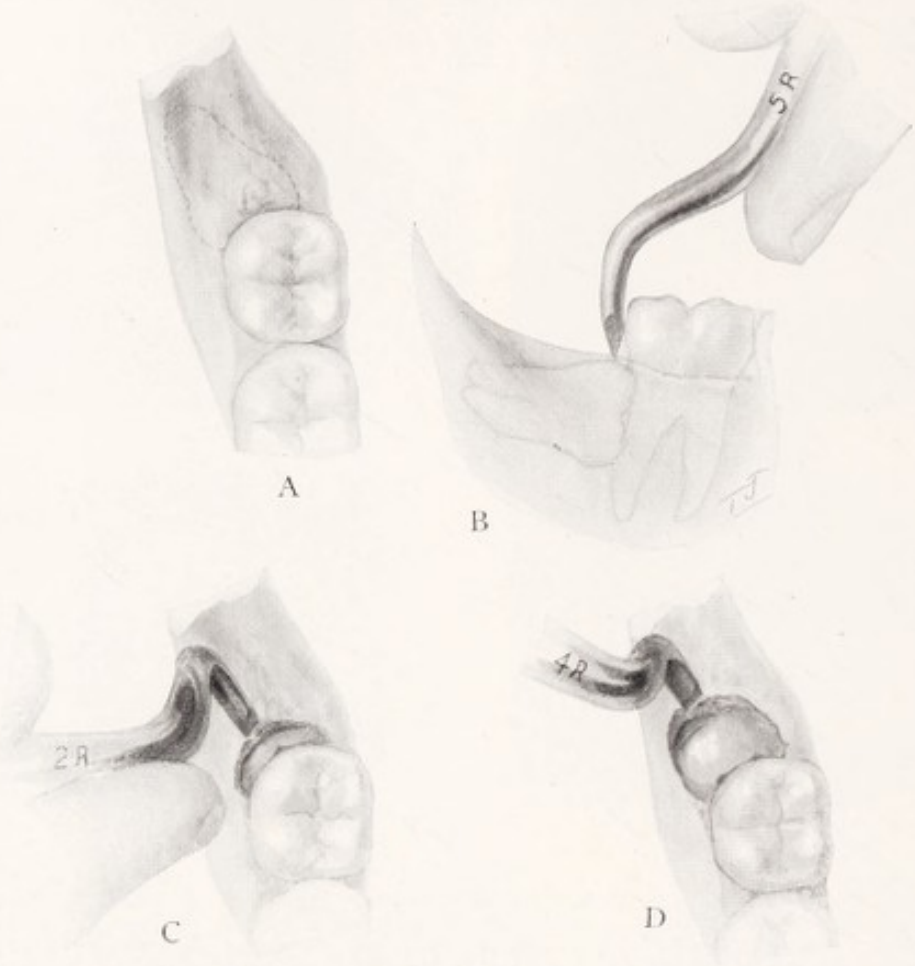


Fig. 721. — Distal Excision of Ossistructure — Horizontal Impaction — Buccolingual Deflection—Mesial Surface Inaccessible. *A*, ossistructure extending over entire distal surface; *B*, ossisector No. 5R applied to penetrate through ossistructure, viewed from buccal; *C*, excision continued with ossisector No. 2R in alignment with distal surface; *D*, excision continued with ossisector No. 4R.

surface of the third molar. A second incision is made distally from the distobuccal surface of the second molar in alignment with the center of the distal surface or along the buccal surface, to a point that will permit the ossistructure on the distal surface to be excised. A third incision is made along the distobuccal surface of the second molar (Figs. 719 and 720 A), or it may extend over the entire distal surface.

Ossistructure Technic—Distal Excision.—The presence of ossistructure on the distal surface, which has been determined by the radiogram, should be verified by a clinical examination of the internal and external oblique ridges to determine the alignment of the crown, so that excision of the external oblique ridge is not made instead of excision of the ossistructure on the distal surface, and excision is confined between the buccal and lingual surfaces of the third molar. In some cases the external oblique ridge extends up to and over the distal surface.

Ossisector No. 2L, 2R; No. 3L, 3R; No. 4L, 4R; or No. 5L, 5R

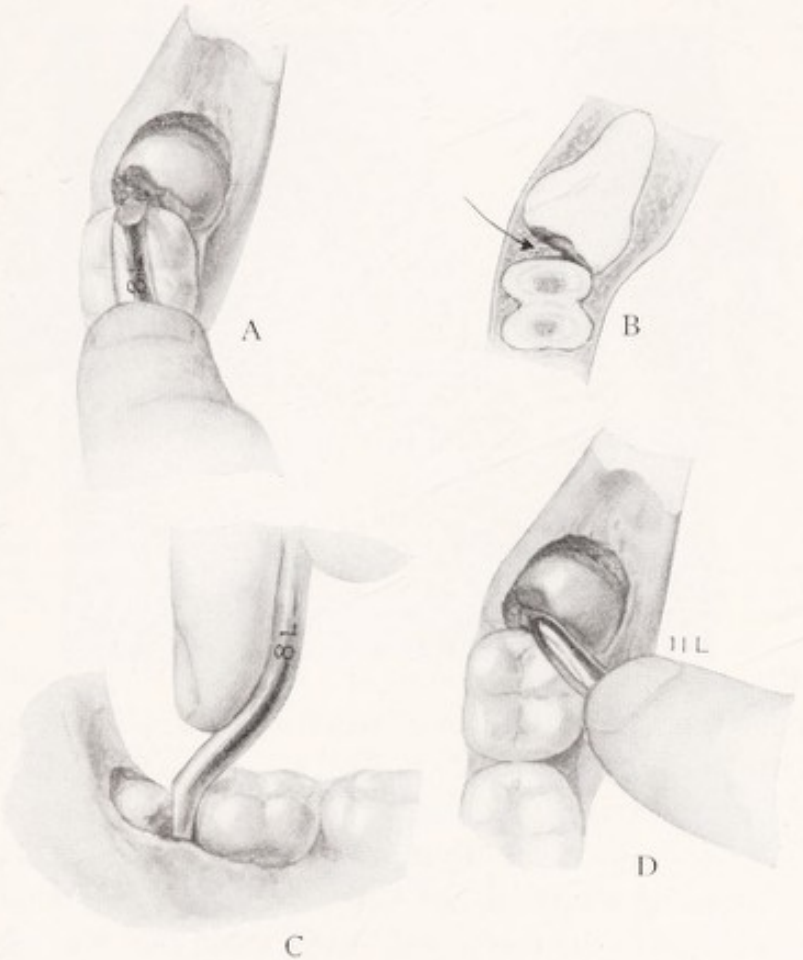


Fig. 722.—Lingual and Occlusal Excisions of Ossistructure—Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 8L applied to excise ossistructure between linguoclusal surface of third molar and distal surface of second; *B*, cross section; *C*, excision, viewed from lingual; *D*, ossisector No. 11L applied for excising ossistructure between linguoclusal surface of third molar and distal surface of second.

is selected, and the gum tissue on the distal surface is displaced with the back of the blade (Figs. 720 B and 720 C), when the blade is directed distally to the ossistructure to be excised, and kept in alignment with the distal surface (Fig. 720 D). The excision on the distal surface should be extensive, extending midway between the gingival third and the apical end of the distal root. Where the ossi-

structure extends over the entire distal surface (Fig. 721 A), or where the external or internal oblique ridge extends up to the distal surface, the initial excision is made with ossisector No. 5L or 5R (Fig. 721 B), as described for a horizontal impaction where there is no deflection (page 639), and is then continued with ossisector No. 2L, 2R; No. 3L, 3R; or No. 4L, 4R (Figs. 721 C and 721 D).

Lingual and Occlusal Excisions.—Where the entire crown is not in contact with the second molar the ossistructure over that part of the occlusal surface not in contact is then excised. Ossisector No. 2L, 2R; No. 8L, 8R; or No. 11L, 11R is selected, and the blade is directed over that part of the occlusal surface of the third molar not in con-

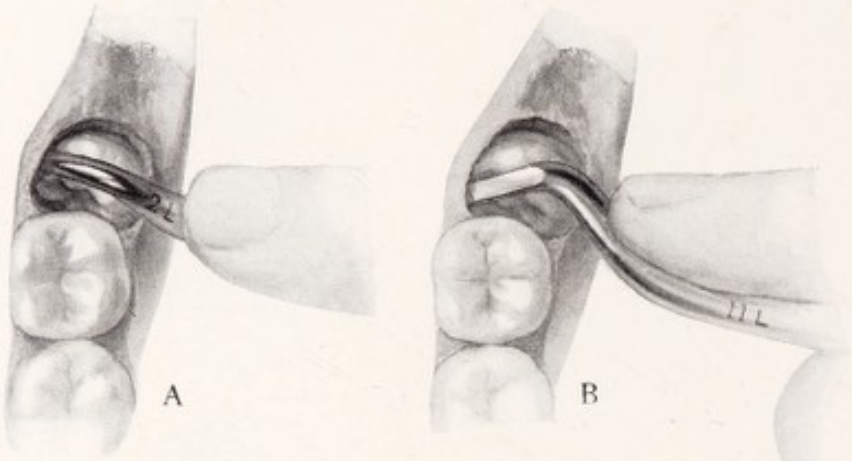


Fig. 723. — Lingual Excision of Ossistructure — Horizontal Impaction — Buccolingual Deflection—Mesial Surface Inaccessible. *A*, ossisector No. 2L applied and wedged between ossistructure and lingual surface; *B*, ossisector No. 11L wedged between ossistructure and lingual surface.

tact with the second, and excision is extended to a point to free the structure between the occlusal surface of the third molar and the distal surface of the second (Fig. 722). By this procedure the small ledges in this region are excised, so that when the tooth is directed upward and distally, the resistance that is usually met will be decreased. When the foregoing excision has been made in those cases where the ossistructure extends on the distal surface beyond the gingival third, the ossisector selected is directed toward the lingual surface to determine whether the ossistructure extends over the greater part of this surface. As it is not practicable to excise the ossistructure in this region by directing the ossisector toward the lingual surface of the tooth, the structure, which is usually very thin, can be fractured away to a point where the lingual surface is partially freed of the ossistructure by repeated applications of the blade (Fig. 723), care being taken not to cause a fracture of part of the lingual plate, as such an incident will leave a very rough surface.

Buccal Excision.—The excision on the buccal surface to gain access

to the mesial surface is made directly toward this surface as in the case where the buccal surface of the third molar is in alignment with the corresponding surface of the second. The buccal surface of the third molar, however, is out of alignment buccally at an angle to the distobuccal surface of the second.

Where the ossistructure does not extend over the entire buccal surface there is frequently a space between the buccal surface and the ossistructure on this surface, and, if present, it will materially decrease the excision on the buccal surface to gain access to the mesial surface (Fig. 724). Ossisector No. 6L for the left side or No. 6R for the right side is selected for this excision, and the blade is applied downward

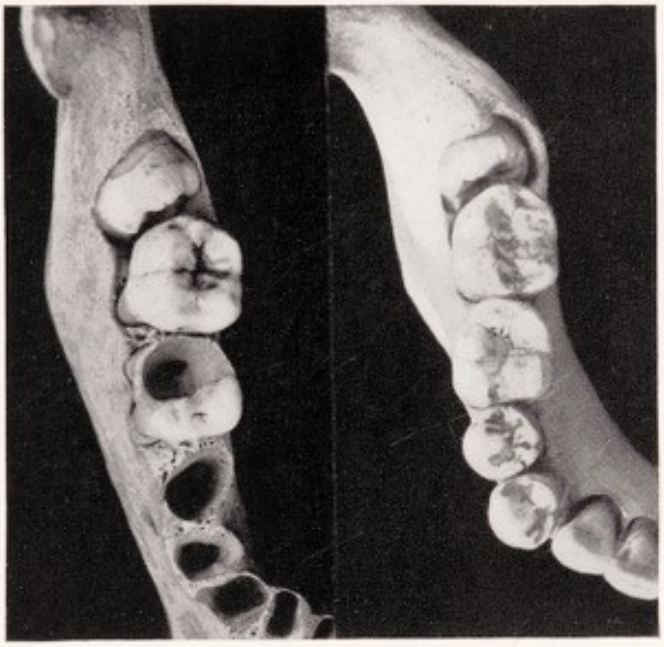


Fig. 724. — Mandible—Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Mandibles showing impacted third molar, with space between buccal surface of tooth and ossistructure.

on the buccal surface in order to excise along this surface to the mesial surface (Fig. 725). Where there is no space (Fig. 726 A) the excision is made to the extent shown in Fig. 726 B. Where the mesial surface is quite a distance from the superior border of the ossistructure or where the structure is very dense, ossisector No. 10L or 11L for the left side or No. 10R or 11R for the right side is then indicated for this excision (Fig. 727). In these cases excision below this surface is unnecessary, and this condition is determined with the blade of the ossisector when it reaches the mesial surface. Usually this excision is made between the crown of the third molar and the external oblique ridge, and an exceptionally good fulcrum is always available; in fact, the fulcrum is better in this type than in any other type of impaction. Extensive pathologic involvement of the ossistructure seldom occurs in this region.

Where the ossistructure extends over the entire distal surface and this excision has been made and the mesial surface is located quite a distance from the superior border of the ossistructure, the roots being large and divergent, the excision on the buccal surface should be more extensive than where the distance to gain access to the mesial surface

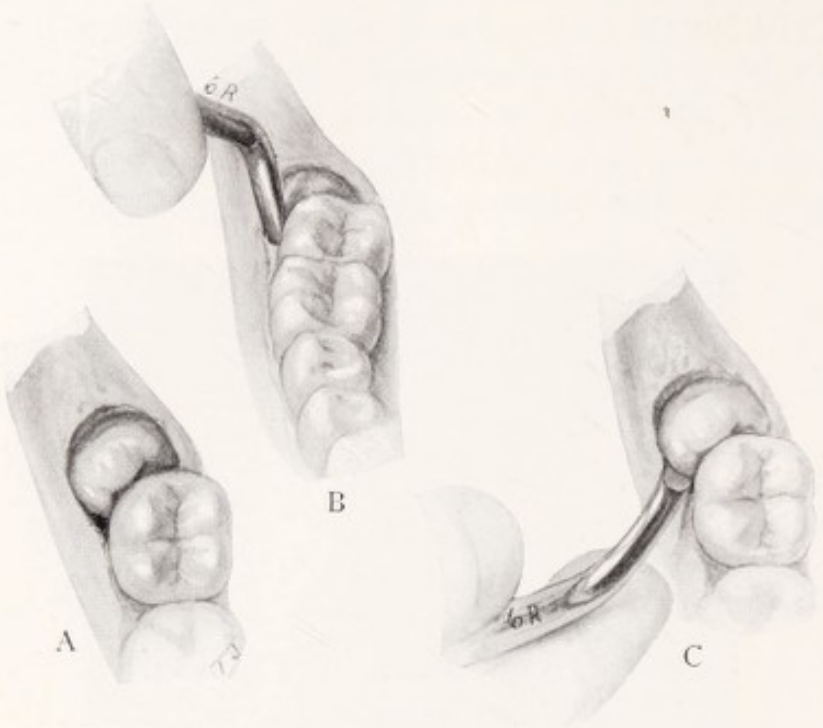


Fig. 725. — Buccal Excision of Ossistructure — Horizontal Impaction — Buccolingual Deflection—Mesial Surface Inaccessible. *A*, space between mesiobuccal surface and ossistructure; *B*, ossisector No. 6R applied to determine a space between mesiobuccal surface and ossistructure for an excision that is not extensive; *C*, instrument applied downward.

is not so great. When the condition mentioned exists the tooth cannot be directed very far upward with exolever No. 2L or 2R, and the operator must then depend on exolever No. 7L or 7R. In order to apply this instrument greater excision is then indicated along the buccal surface to permit this size blade to be adjusted below the mesial sur-

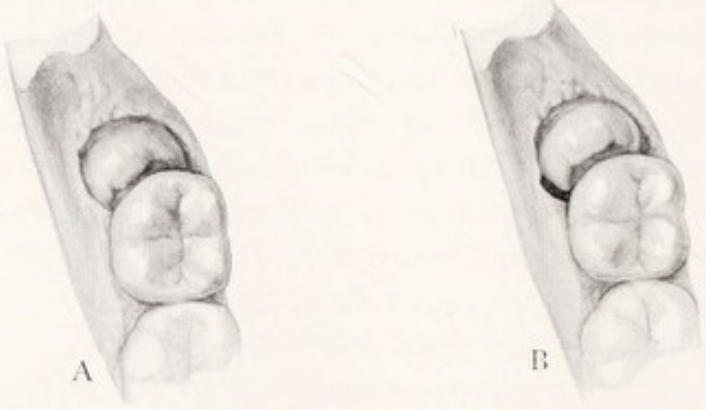


Fig. 726. — Buccal Excision of Ossistructure — Horizontal Impaction — Buccolingual Deflection—Mesial Surface Inaccessible. *A*, no space present between buccal surface and ossistructure; *B*, extent of excision indicated.

face. Where there is quite a distance for access the fulcrum is often too far away from the mesial surface, and in that instance excision is made downward on the buccal surface from the superior border to a point where the structure on that surface can be utilized as a fulcrum.

Exolever Technic—Mesial Application.—After the excision of the ossistructure has been made as described above, exolever No. 2L for the left side or No. 2R for the right side, which has a very small blade,

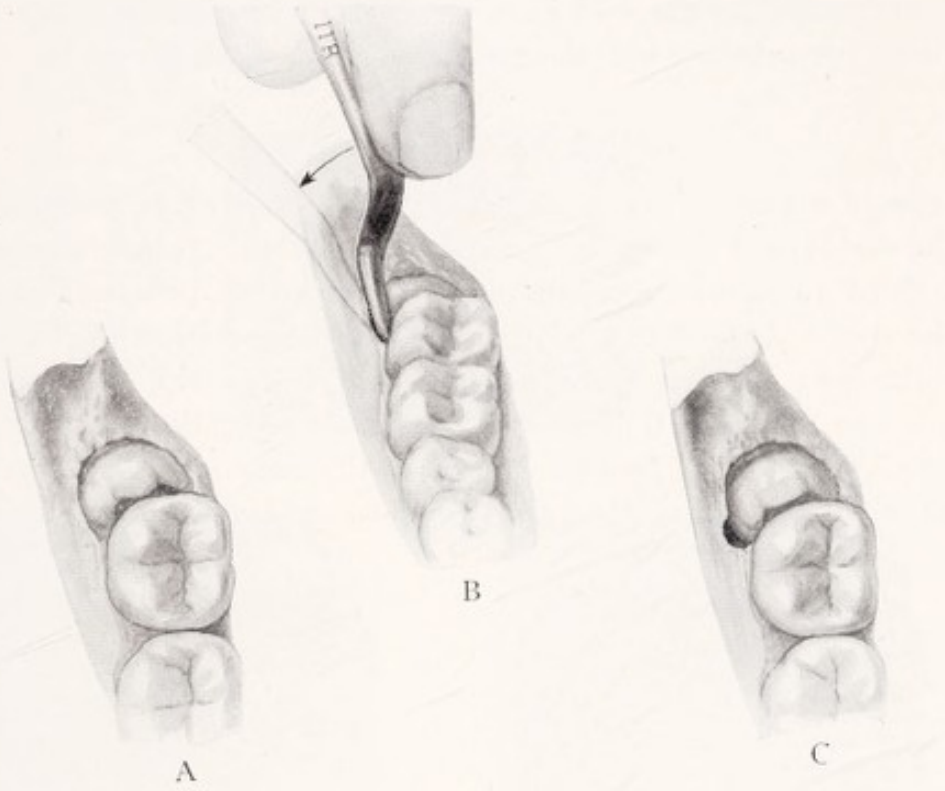


Fig. 727. — Buccal Excision of Ossistructure — Horizontal Impaction — Buccolingual Deflection—Mesial Surface Inaccessible. *A*, no space present between buccal surface and ossistructure; *B*, ossisector No. 11R applied for excision; *C*, extent of excision indicated.

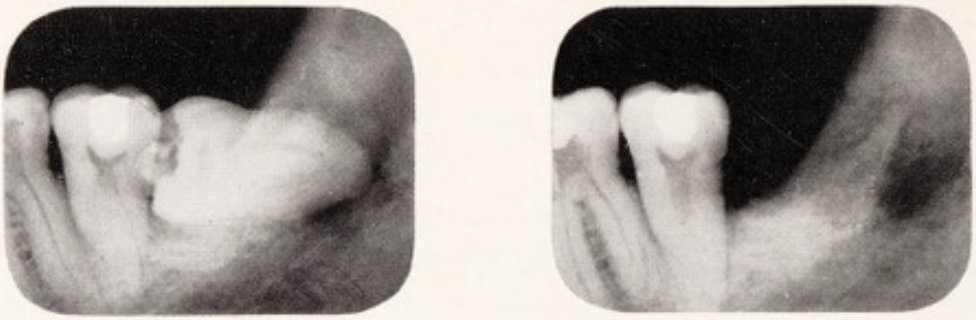
is selected. The gum tissue on the buccal surface is displaced with the back of the blade, and the blade, with the flat side applied to the buccal surface, is directed downward on this surface until the mesial surface has been reached. The handle is then directed buccally to apply the blade between the mesial surface and the ossistructure. When the blade has been adjusted to the mesial surface the handle is forced downward, which movement will raise the tooth upward, as described on page 690. If, after the tooth has been raised some distance, any appreciable resistance is presented in consequence of a marked divergency of the roots, exolever No. 3L for the left side or No. 3R for the right side is selected to complete the extraction. If, however, the mesial surface is so far from the ossistructure along the buccal surface as to cause the loss of the fulcrum, an exolever of the same design

with a larger blade is selected and the exolever movements are continued until the extraction is completed.

Not much resistance may be expected where there is a complete fusion of the roots or where there is only a small septum between them. Where, however, the roots are markedly divergent, some resistance will be presented during the upward extraction movement, in which case exolever No. 7L or 7R is then indicated to overcome the resistance. When this exolever is used, the blade is applied along the mesiobuccal surface, and the exolever movements are made as described for a mesiobuccal application (page 692).

SUMMARY OF CASES

In the case shown in Fig. 728 A, the mesial root is inclined distally and the distal root is inclined mesially and fused. The occlusal surface of the third molar impinges upon the distobuccal surface of the second, and the roots of the latter tooth are fused, in addition to which pathologic changes involve the interseptum between the first and second molars. In Fig. 728 B is shown the case after the third molar was extracted, and it will be observed that the second molar was not disturbed, thus demonstrating that if the exolever movements are cor-



A B

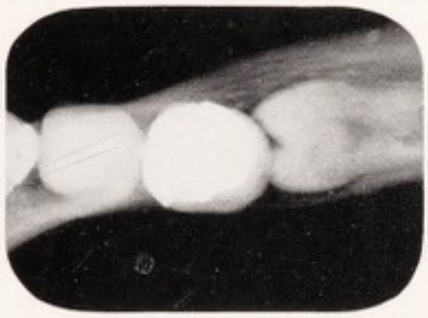
Fig. 728. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Same case. *A*, fusion of second molar roots also fusion of third molar roots, with pathologic condition involving interseptum between first and second molars; *B*, socket after extraction.

rectly made, there will be no liability of the second molar being loosened during the extraction of the third, as the radiogram in the case presents every disadvantage of which the second molar is susceptible when in the position shown.

In the case shown in Fig. 729 A, where the mesial root is inclined distally and the distal root is straight, the occlusal surface of the third molar impinges upon the distobuccal surface of the second and the greater part of the crown of the latter tooth has been filled. While executing the exolever technic the operator should use as a fulcrum the ossistructure in the location of the mesio-

buccal surface of the third molar and not the second molar, as the use of the second molar as a fulcrum would endanger the large filling in that tooth. In Fig. 729 B the occlusal radiogram of the case shows the contact of the occlusal surface of the third molar with the distobuccal surface of the second and the extent that the crown has been filled. In Fig. 729 C is shown the case after the extraction of the third molar, and it should be observed that the filling in the second molar was not disturbed, thus demonstrating that if the exolever movements are correctly made there will be no liability of disturbing either the filling or the second molar.

A



B

C

Fig. 729. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Same case. *A*, mesial root inclined distally and distal root straight. The ossistructure on distal surface extends to gingival third and over greater part of lingual and buccal surfaces. A large filling involves greater part of crown of second molar. *B*, occlusal view, showing location of contact of occlusal surface with distobuccal surface of second molar; *C*, socket after extraction.

In the case shown in Fig. 730 A, where both roots are inclined distally, which presents a type of root formation that is not frequently seen, with the ossistructure extending on the distal surface up to the gingival third, excision is made to quite an extent distally. The radiogram shows a slight lingual deflection of the second molar, with the first molar in approximately normal alignment. In the execution of the exolever movements the tooth can be directed upward and distally in conformity with the root formation.

In the case shown in Fig. 730 B, where the mesial root is inclined distally and the distal root is straight, with both roots fused, the ossistructure on the distal surface extends slightly beyond the gin-

gival third. The mesial surface is quite a distance below the superior border, and the ossistructure below this surface is slightly involved by pathologic changes. Excision on the distal surface is indicated, and no difficulty should be experienced when excising on the buccal surface to reach the mesial surface, as there is usually a space between the buccal surface and the ossistructure on this surface. Very little resistance will be encountered when the tooth is directed upward and distally with the exolever.

A B

Fig. 730. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. *A*, both roots inclined distally, with ossistructure on distal surface extending to gingival third and over greater part of lingual and buccal surfaces; *B*, mesial root inclined distally and distal root straight, both roots being fused, with ossistructure on distal surface extending slightly beyond gingival third and over greater part of lingual and buccal surfaces.

In the cases shown in Fig. 731, where the mesial root is inclined distally and the distal root is straight, with a large septum between the roots, the ossistructure on the distal surface extends slightly beyond the gingival third. The mesial surface is quite a distance below the superior border of the ossistructure, and there is a slight area of pathologic involvement below this surface. Excision on the distal surface is indicated to decrease resistance on account of the root formation. Excision on the buccal surface is also indicated in order to obtain access with the exolever to the mesial surface. The distal root is long, but not very strong, and the mesial root does not present any considerable strength. When the tooth is directed upward

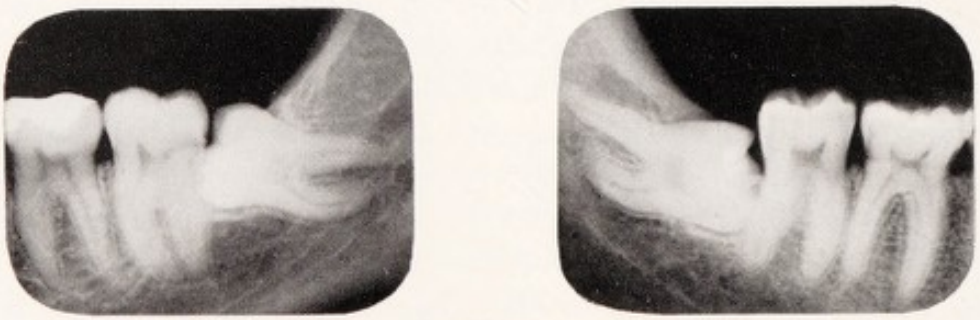
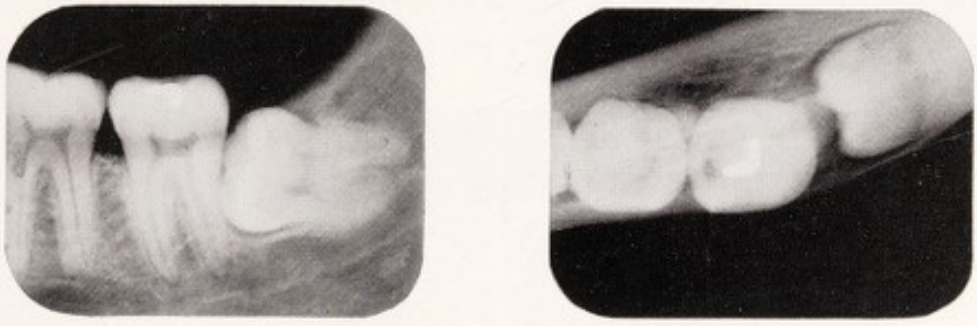


Fig. 731. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root straight and extremely long. The ossistructure on distal surface extends slightly beyond gingival third and over greater part of lingual and buccal surfaces.

and distally during the exolever movements, there will be a liability of a fracture of the roots, and the operator should be prepared to remove any remaining parts in case a fracture occurs.

In the case shown in Fig. 732 A, where the mesial root is inclined distally and the distal root is straight, the ossistructure on the distal surface is slightly involved by a pathologic condition, an unusual condition in this type of impaction, and excision on the distal surface is indicated distal to the gingival third. The mesial surface is quite a distance from the superior border of the ossistructure, and, as there is a small area of pathologic involvement below this surface, excision on the buccal surface is indicated in order to apply the exolever to the mesial surface. There is usually a space between the buccal surface and the ossistructure on this surface, and very little excision will be necessary to gain access to the mesial surface. When the tooth is directed upward and distally, some resistance will be encountered, but the roots are strong enough to withstand the strain and no fracture will occur. Figure 732 B is an occlusal view of the case, which shows the alignment of the buccal surface compared with the distobuccal surface of the second molar, and also the space between the buccal surface and the ossistructure on this surface.



A B

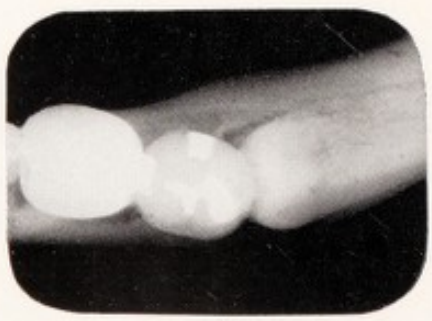
Fig. 732. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. *A*, mesial root inclined distally and distal root straight. The ossistructure on distal surface extends beyond gingival third and over greater part of lingual and buccal surfaces. *B*, occlusal view.

In the cases shown in Fig. 733, where the mesial root is inclined distally and the apical third extends upward, the distal root being straight, with a septum between them, a great deal of resistance will be encountered when the exolever technic is executed. An extensive excision on the distal surface is made to decrease resistance at this point, and excision on the buccal surface is indicated to adjust the exolever to the mesial surface. When the tooth is directed upward and distally, the operator need not hesitate to execute the exolever movements, as any resistance will be more readily overcome by a definite execution than by repeated applications.

Fig. 733. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and extends upward at apical third and distal root straight. The ossistructure on distal surface extends up to gingival third and over greater part of lingual and buccal surfaces.

In the case shown in Fig. 734 A, where the mesial root is inclined distally and the distal root is straight, the ossistructure on the distal surface extends up to the gingival third. Excision on the distal surface is indicated to decrease resistance at this point and excision on the buccal surface is indicated to apply the exolever below the mesial surface. As the greater part of the occlusal surface of the third molar is in contact with the distobuccal surface of the second, precaution should be taken that the third molar, when being directed upward and distally, is not forced against the second, as such a movement will loosen the latter tooth. The strength of the roots of the third molar will permit the exolever movements to be executed without the liability of fracturing the roots. Figure 734 B is an occlusal view, and Fig. 734 C shows the socket after extraction.

A



B

C

Fig. 734.—Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. *A*, mesial root inclined distally and distal root straight. The ossistructure on distal surface extends to gingival third and over greater part of lingual and buccal surfaces. *B*, occlusal view; *C*, socket after extraction.

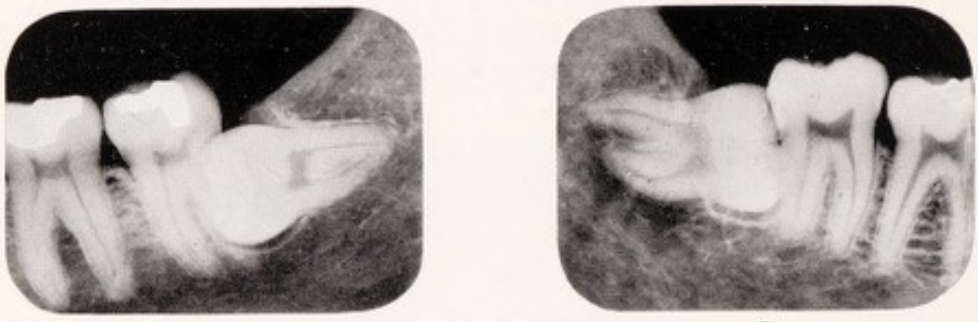
In the cases shown in Fig. 735, where the mesial root is inclined distally and the distal root is straight, the roots are fused. The ossistructure extends over the greater part of the distal surface and is slightly involved by pathologic changes. This pathologic condition, however, will simplify the excision, which is extended distally beyond the gingival third. Excision on the buccal surface to gain access to the mesial surface is made from the superior border of the ossistructure down to a short distance above the mesial surface, which is quite a distance from the superior border. As the occlusal surface of the third molar is in contact with the middle third of the distal root of the second, precaution should be taken that the third molar, when being directed upward and distally, is not forced against the distal root of the second, as such a movement will loosen the latter tooth.

Fig. 735. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root straight, roots being fused. The ossistructure extends over entire distal surface, which is slightly involved by a pathologic condition, also over entire lingual and buccal surfaces.

In the case shown in Fig. 736 A the mesial root is inclined distally and the distal root is straight, with the roots fused, and the ossistructure on the distal surface is involved by a pathologic condition to the gingival third. The mesial surface of the third molar is quite a distance from the superior border of the ossistructure, and the occlusal surface is in contact with the distal root of the second molar. No definition of the injury that may have been caused by the occlusal surface of the third molar pressing against the distal root of the second can be positively determined in this type of case. Where operative procedure on the third molar is contemplated in an effort to save the second molar, an excision on the distal surface of the third molar is indicated. In order to gain access to the mesial surface, the blade of the ossisector selected should be of sufficient length to enable the operator to excise the ossistructure on the buccal surface to a point slightly above the mesial surface. When the exolever is applied to the mesial surface to direct the tooth upward and distally, the force exerted on the initial movement should be sufficient to loosen the tooth, and the size of the exolever blade increased as may be deemed necessary. Any pressure directing the tooth toward the distal root of the

second molar should be avoided, as such pressure will loosen the second molar.

In the case shown in Fig. 736 B, where the mesial root is inclined distally and the distal root is straight, with the distal surface free of ossistructure, owing to a pathologic condition, down to the gingival third, the occlusal surface is in contact with the distobuccal surface and distal root of the second molar and the pressure of the third molar against the second has displaced the occlusal surface of the second molar upward beyond the first molar. The lack of positive definition of any involvement, due to the pressure against the middle third of the distal root of the second molar, will make the operative procedure a questionable one if the second molar is to be retained. After the impacted tooth is extracted, there may be an extensive pressure absorption on the distal root of the second molar with which the crown of the third molar was in contact, which condition cannot be positively determined in this case, and as the pressure created has already deflected the alignment of the occlusal surface of the second molar upward compared with the first molar, the possibility of retaining the second molar is questionable. Where operative procedure is to be followed, the technic is the same as described for the case shown in Fig. 736 A.

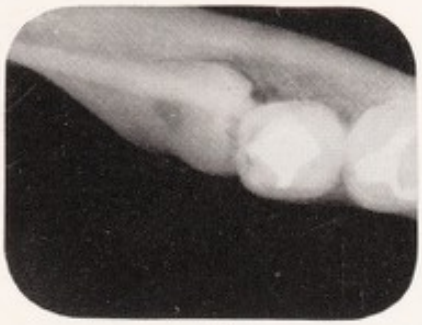


A B

Fig. 736. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. *A*, mesial root inclined distally and distal root straight, roots being fused. The ossistructure on distal surface is involved by pathologic condition to gingival third, and ossistructure extends over entire lingual and buccal surfaces. *B*, mesial root inclined distally and distal root straight. The ossistructure on distal surface is involved by pathologic condition to gingival third, and structure extends over entire lingual and buccal surfaces. The entire crown is in contact with distobuccal surface of second molar, and occlusal surface of latter tooth is deflected upward.

In the case shown in Fig. 737 A the mesial root is inclined distally and the distal root is inclined mesially. The ossistructure on the distal surface extends slightly beyond the gingival third, and a slight excision is indicated at this point. The mesial surface is quite a distance from the superior border of the ossistructure, and excision on the buccal surface is indicated to reach the mesial surface. Very little resistance will be encountered when the exolever movements are executed. In Fig. 737 B is shown an occlusal view of the case, and in Fig. 737 C is shown the socket after extraction.

A



B

C

Fig. 737. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. *A*, mesial root inclined distally and distal root inclined mesially, with ossistructure on distal surface extending to gingival third and over greater part of lingual and buccal surfaces; *B*, occlusal view; *C*, socket after extraction.

In the cases shown in Fig. 738, where the mesial root is inclined distally and the distal root is inclined mesially, with a septum between the roots, the ossistructure on the distal surface extends to the gingival third, and a slight excision on this surface is indicated to decrease any resistance on account of the root formation. The mesial surface is varied in distance from the superior border of the ossistructure, and excision on the buccal surface is indicated to reach the mesial surface with the exolever. When the exolever is adjusted to the mesial surface, the initial application is made with sufficient force to fracture the septum between the roots.

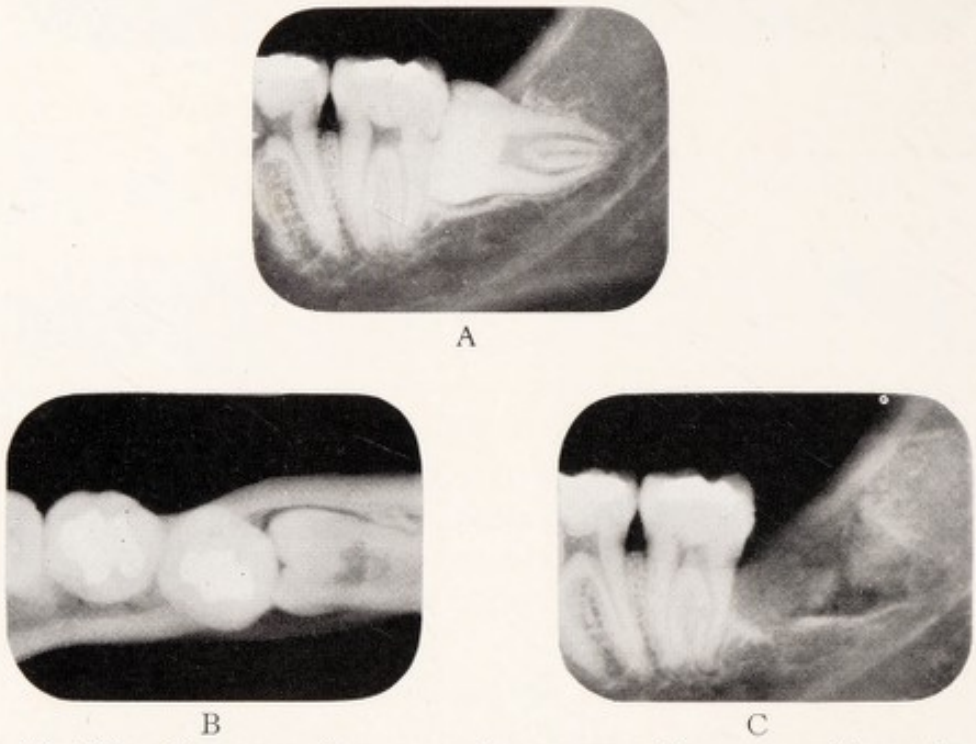
In Fig. 739 are shown three radiograms of the same case.

In Fig. 739 A, where the mesial root is inclined distally and the distal

Fig. 738. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially, with ossistructure on distal surface extending to gingival third and over greater part of lingual and buccal surfaces.

root is inclined mesially, the septum between the roots is small and the roots are not large enough to present a great deal of strength, being liable to fracture. The ossistructure on the distal surface extends slightly beyond the gingival third, and extensive excision is indicated on this surface. Excision is made on the buccal surface from the superior border of the ossistructure down to a short distance above the mesial surface. The exolever movements should be made with the same degree of force as if the roots were of great strength and a fracture will rarely occur.

In Fig. 739 B the occlusal radiogram shows the contact of the occlusal surface of the third molar extending almost up to the bifurcation on the buccal surface of the second, with a space shown between the buccal surface and the ossistructure on this surface. In Fig. 739 C is shown the socket after extraction.



A B C

Fig. 739. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Same case. *A*, mesial root inclined distally and distal root inclined mesially; *B*, occlusal view, showing contact of occlusal surface extending almost up to bifurcation on buccal surface of second molar; *C*, socket after extraction.

In the case shown in Fig. 740 A, where the mesial root is inclined distally and the distal root is inclined mesially, both roots are extremely long and divergent, and the septum between them will prove to be quite a resisting factor when the exolever technic is executed. Excision is made on the buccal surface from the superior border of the ossistructure down to a short distance above the mesial surface, and is also indicated on the distal surface. Excision is also indicated over the

lingual surface and over that part of the occlusal surface not in contact with the distal surface of the second molar. Considerable force is applied to fracture the septum between the roots when directing the tooth upward and distally.

Figure 740 B is an occlusal view, which shows the location of contact of the occlusal surface upon the distobuccal surface of the second molar, the alignment of the buccal surface compared with the corresponding surface of the second molar, the space between the buccal surface and the ossistructure on this surface, and that part of the occlusal surface not in contact with the distal surface of the second molar.

A B

Fig. 740. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. *A*, mesial root inclined distally and distal root inclined mesially, both roots being extremely long and divergent with a large septum between them. The ossistructure on distal surface extends beyond gingival third and over entire lingual and buccal surfaces. *B*, occlusal view.

In the cases shown in Fig. 741 the mesial root is inclined distally and the distal root is inclined mesially, with a septum between the roots. Care should be taken to excise only the ossistructure on the distal surface, as the marked deflection of the third molar may cause the operator to excise where excision is not indicated. When excising on the buccal surface for access to the mesial surface, no attempt should be made to apply the exolever until the mesial surface has been reached, as this surface is quite a distance below the superior border of the ossistructure, and trial attempts to apply the exolever will weaken

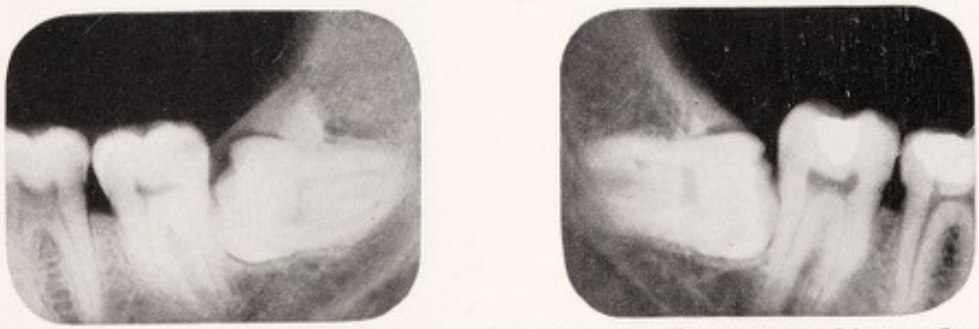


Fig. 741. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially, with ossistructure extending over greater part of distal surface and entire lingual and buccal surfaces.

the fulcrum. In addition to the foregoing excision, a slight excision is indicated on that part of the linguoclusal surface that is free of the distal surface of the second molar and on the lingual surface. The occlusal surface of the third molar is often in close contact with the distobuccal surface of the distal root of the second, and care should be exercised not to disturb the latter tooth.

In the cases shown in Fig. 742, where the mesial root is inclined distally and the distal root is inclined mesially, with the ossistructure extending over the greater part of the tooth, the structure around the entire crown being entirely involved by a pathologic condition, not a great deal of resistance will be encountered in a case of this kind when the exolever technic is executed after the necessary excision has been made on the distal and buccal surfaces.

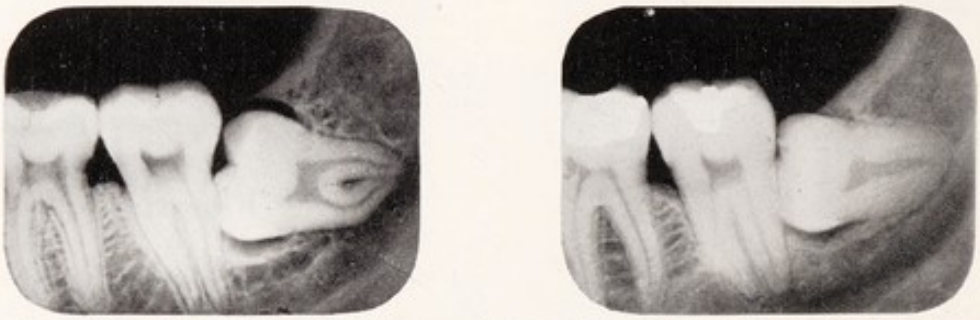


Fig. 742. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially. The ossistructure extends over greater part of crown and there is a pathologic involvement of structure around entire crown.

In the cases shown in Fig. 743, where the mesial root is straight and the distal root is inclined mesially, the ossistructure on the distal surface extends up to the gingival third, and on account of the character of the root formation, excision on the distal surface is indicated to decrease resistance. The mesial half of the occlusal surface of the third molar is in contact with the gingival third of the distobuccal surface of the distal root of the second. When the exolever movements are made upward and distally, if sufficient excision

Fig. 743. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Mesial root straight and distal root inclined mesially, with ossistructure on distal surface extending to gingival third and over greater part of lingual and buccal surfaces.

on the distal surface has been made, there will be very little probability of fracturing the roots. Excision is indicated on the buccal surface to gain access to the mesial surface.

In the cases shown in Fig. 744 A the mesial root is straight and the distal root is inclined mesially at the apical third, with an extra root between them. The ossistructure on the distal surface extends beyond the gingival third, and, on account of the character of the root formation, excision is made on the distal surface to the apical third of the root. Excision is also indicated on the buccal surface in order to gain access to the mesial surface. When the exolever movements are made upward and distally and sufficient excision has been made on the distal surface the extra root formation and mesial inclination of the distal root will not offer the resistance indicated by the root formation shown in the radiogram, and the tooth can be removed without causing a fracture of the roots.

Figure 744 B is an occlusal view, which shows the relation of the contact of the crown of the third molar with the crown of the second. In Fig. 744 C is shown the socket after extraction, and in Fig. 744 D is shown a photograph of the extracted tooth.

In the case shown in Fig. 745 A, where the mesial root is straight and the distal root is inclined mesially, the ossistructure on the distal surface extends slightly beyond the gingival third, and excision

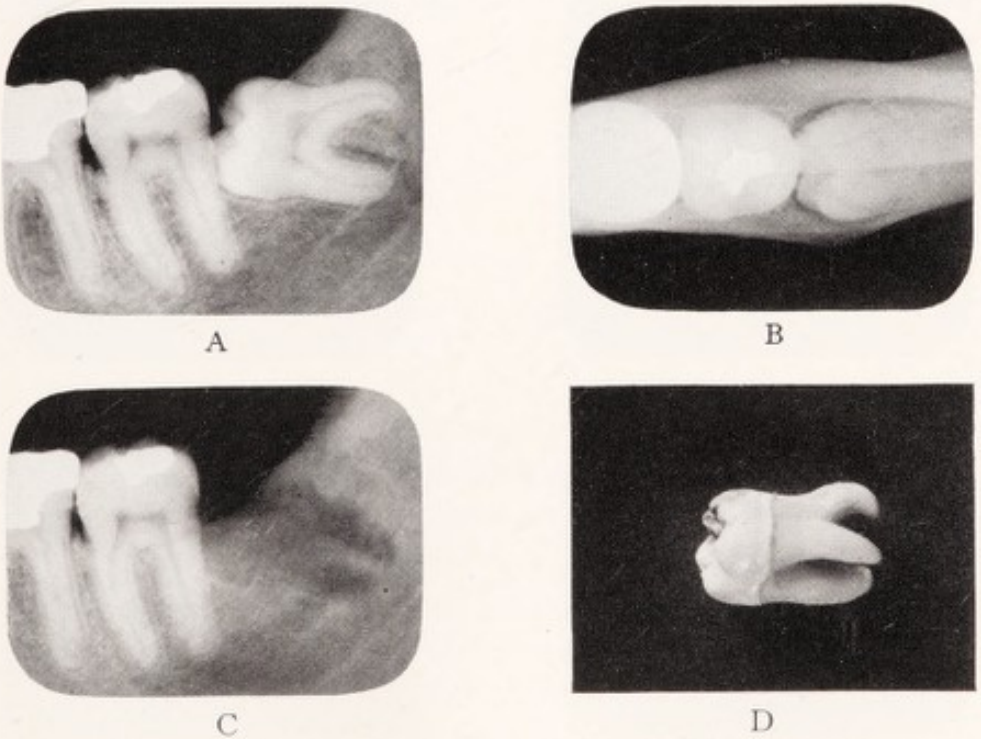
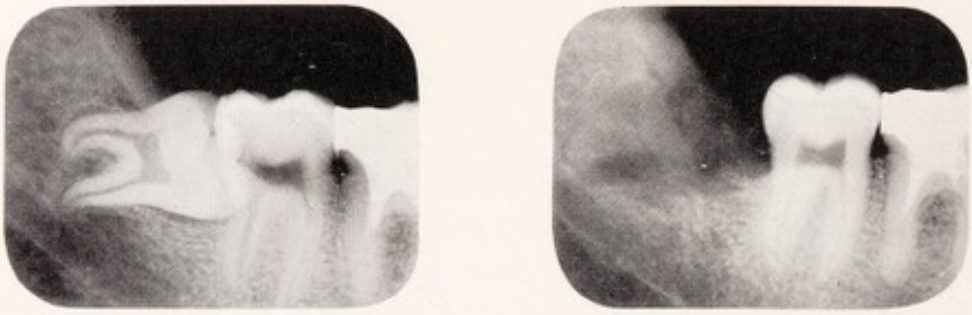


Fig. 744. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Same case. *A*, mesial root straight and distal root inclined mesially at apical third, with an extra root between them. The ossistructure on distal surface extends beyond gingival third and over greater part of lingual and buccal surfaces. *B*, occlusal view; *C*, socket after extraction; *D*, photograph of extracted tooth.

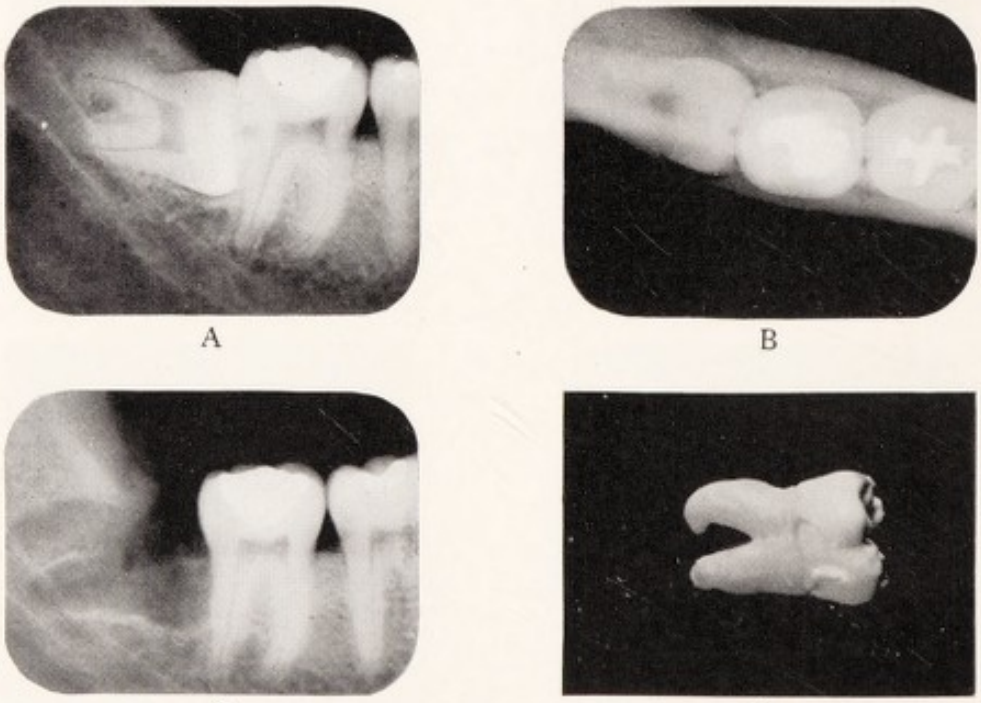
on the distal surface is indicated. Excision is indicated on the buccal surface to gain access to the mesial surface. In addition to the foregoing excision, a slight excision is indicated over that part of the occlusal surface that is free of the distolingual surface of the second molar. When the exolever movements are made upward and distally the initial application is made with sufficient force to fracture the septum between the roots. In Fig. 745 B is shown the socket after extraction.



A B

Fig. 745. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Same case. *A*, mesial root straight and distal root inclined mesially, with ossistructure on distal surface extending slightly beyond gingival third and over greater part of lingual and buccal surfaces; *B*, socket after extraction.

In the case shown in Fig. 746 A where the mesial root is straight and the distal root is inclined mesially at the apical third, the ossi-



A B C D

Fig. 746. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Same case. *A*, mesial root straight and distal root inclined mesially at apical third. The ossistructure extends over greater part of distal surface and over entire lingual and buccal surfaces. *B*, occlusal view; *C*, socket after extraction; *D*, photograph of tooth.

structure on the distal surface extends almost up to the occlusal surface, and on account of the character of the root formation, extensive excision on the distal surface is indicated. There is no space between the second and third molars, and when the exolever movements are made upward and distally, there is always a liability of disturbing the second molar if precaution is not taken to avoid forcing the third molar against the second. Excision is indicated on the buccal surface to gain access to the mesial surface. Excision over the occlusal surface cannot be made as in the case where part of the surface is free of contact with the second molar.

Figure 746 B is an occlusal view, which shows the relation of contact; in Fig. 746 C is shown the socket after extraction, and in Fig. 746 D is shown a photograph of the extracted tooth.

In the cases shown in Fig. 747 both roots are straight, a type not often encountered in a buccolingual deflection. A slight excision is indicated on the distal surface in order to decrease resistance on account of the character of the root formation. Excision is made on the buccal surface in order to gain access to the mesial surface. The exolever movements are deliberately made to avoid repeated applications. As both roots are of sufficient size to overcome the resistance of the septum, a fracture is not liable to occur.

Fig. 747. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Roots straight, with ossistructure on distal surface extending up to gingival third and over greater part of lingual and buccal surfaces.

In the case shown in Fig. 748, where the mesial root is inclined distally and the distal root is inclined mesially, the ossistructure extends over the entire distal surface. There is also ossistructure over the occlusal surface, which is accessible for excision, as there is only a small part of the occlusal surface of the third molar in contact with the distobuccal surface of the distal root of the second. This excision is made by inserting the ossisector blade between the occlusal surface of the third molar and the distolingual surface of the distal root of the second, a procedure that is difficult on account of the lack of space. A slight excision is made on the lingual surface in order to decrease resistance at this point. Excision is made on the

distal surface beyond the gingival third of the tooth and on the buccal surface to a short distance above the mesial surface. Considerable resistance will be encountered during the execution of the exolever movements.

Fig. 748. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially, both roots being extremely long. The ossistructure extends over entire mesial, distal, lingual and buccal surfaces and between occlusal surface and second molar.

In the cases shown in Fig. 749, the conditions are complicated in character on account of the divergency of the roots, which are unfavorable for the execution of the exolever movements, as there is a liability of fracturing one or both roots. Extensive excision of the ossistructure on the distal surface is indicated, and excision on the buccal surface is also indicated from the superior border of the ossistructure down to a short distance above the mesial surface. In such cases, as soon as the third molar has been directed upward and distally, by the application of the exolever to the mesial surface, to a point where the occlusal surface of the third molar is clear of the distal surface of the second, and the tooth is in a mesioangular position, a buccal application of the exolever is made as in a case where the bifurcation of the tooth is at or beyond the superior border of the ossistructure, and a fracture of either root can be avoided by this method.

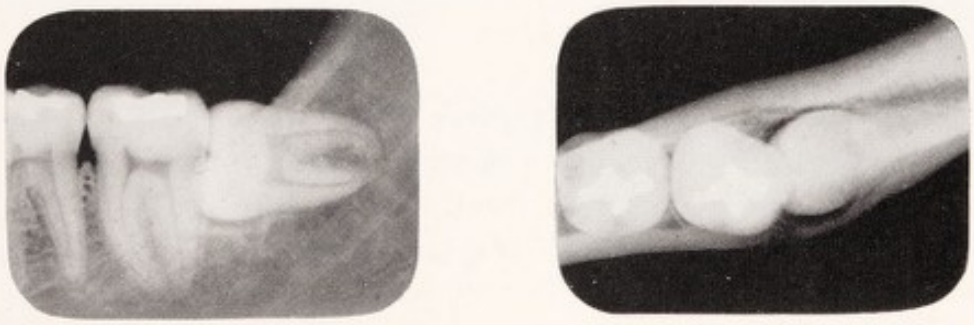
In Fig. 750 the case is similar to those shown in Fig. 749, except that the roots are not strong enough to withstand the pressure applied when the exolever movements are being executed, and there is a

Fig. 749. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Divergency of roots, with a large septum. There is a variation in location of ossistructure on distal and buccal surfaces.

liability of fracturing them. The operator, however, should be prepared to extract one or both roots in case a fracture occurs.

Fig. 750. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Roots divergent and of small size. The ossistructure on distal surface extends to gingival third and over greater part of lingual and buccal surfaces.

In the case shown in Fig. 751 A, where the mesial root is inclined distally and the distal root is inclined mesially at the apical third, the formation of the roots and the septum between them indicate that they are liable to fracture. Excision on the distal surface should be extensive to decrease resistance, and this procedure often tends to obviate a fracture of the roots. Excision on the buccal surface is made from the superior border of the ossistructure to a short distance above the mesial surface. The exolever technic is executed upward and distally. Figure 751 B, an occlusal view, shows the contact of the occlusal surface with the buccal surface extending almost up to the bifurcation, and the space between the buccal surface and the ossistructure on this surface is visible in the radiogram.



A B

Fig. 751. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Same case. *A*, mesial root inclined distally and distal root inclined mesially at apical third. The ossistructure on distal surface extends beyond gingival third, and structure extends over greater part of lingual and buccal surfaces. *B*, occlusal view.

In the case shown in Fig. 752 A, where the roots are fused and the ossistructure extends over the entire tooth, with an artificial crown attached to the second molar, excision is indicated on the distal surface, over that part of the occlusal surface that is not in contact with the distal root of the second molar and on the buccal surface to gain access

to the mesial surface. In Fig. 752 B the occlusal radiogram shows quite a decided lingual inclination, and the alignment of the buccal surface of he third molar is compared with the corresponding surface of the second. The exolever technic is executed upward and distally, so that the third molar does not disturb the artificial crown attached to the second molar. Figure 752 C shows the socket after extraction and Fig. 752 D shows the extracted tooth.

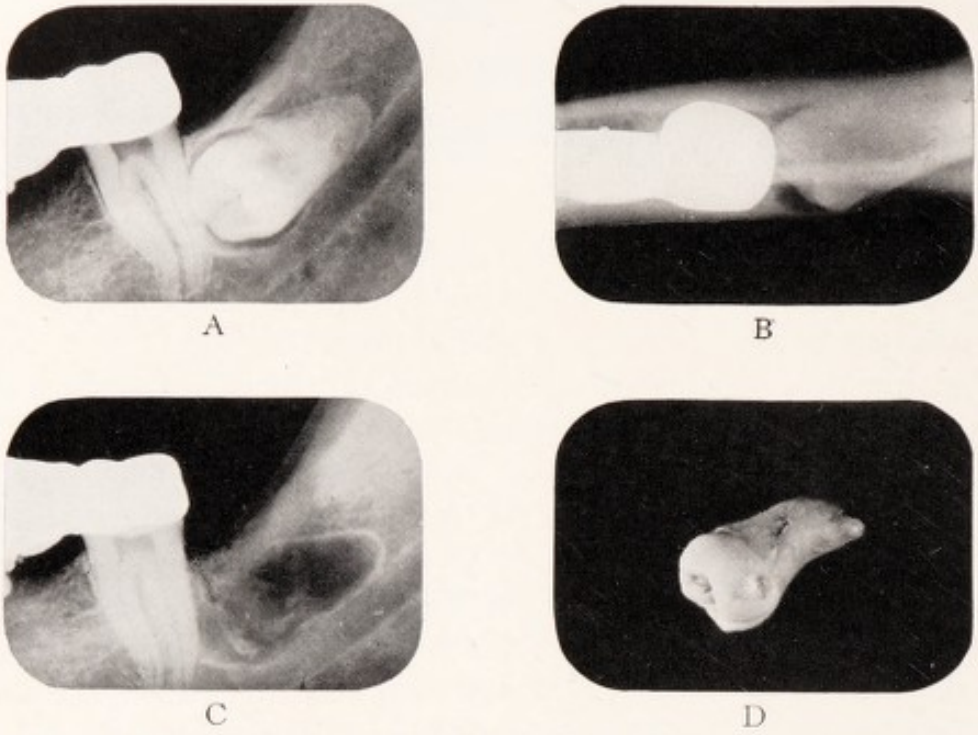


Fig. 752. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Same case. *A*, roots fused, with ossistructure extending over entire tooth; *B*, occlusal view showing a decided buccolingual deflection; *C*, socket after extraction; *D*, photograph of extracted tooth.

In the cases shown in Fig. 753, where there is a variation in the character of the root formation, the ossistructure extends over the entire tooth. Excision is indicated on the distal surface, on the buccal surface from the superior border of the ossistructure to a short distance

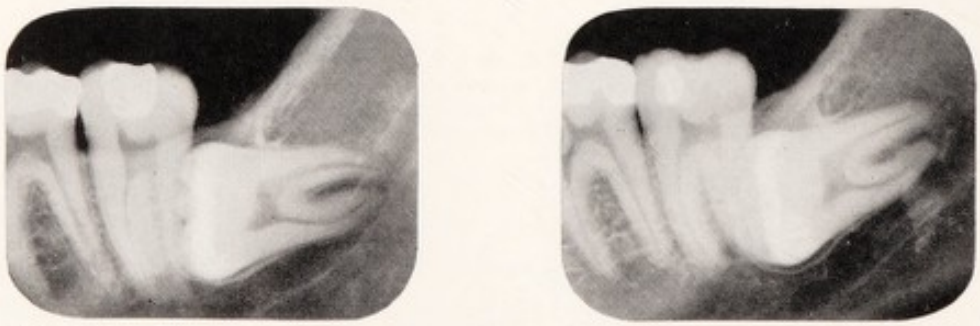


Fig. 753. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Variation in root formation, with ossistructure extending over entire tooth. The greater part of occlusal surface is in contact with distal root of second molar.

above the mesial surface, and on that part of the occlusal surface not in contact with the distobuccal surface of the distal root. When the exolever blade is adjusted to the mesial surface to direct the tooth upward and distally, the size of the blade is increased as the tooth is directed upward in order to improve the fulcrum. The pressure of the crown upon the distal root of the second molar is usually sufficient to result in a pressure absorption of the distal root, and the operative procedure is always questionable on account of lack of definition to detail the condition of the distal root of the second molar.

In the cases shown in Fig. 754, where there is a variation in the root formation, with the ossistructure extending over the entire tooth, the greater part of the occlusal surface of the third molar is in contact with the distobuccal surface of the distal root of the second, and the involvement of this root by the pressure of the third molar usually makes the retention of the second molar problematical. In addition to the involved distal surface, the interseptum between the first and second molars is involved on account of the loss of contact between these teeth from the pressure of the occlusal surface of the third molar against the distal root of the second.

Fig. 754. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Variation in root formation, with ossistructure extending over entire tooth. The interseptum between first and second molars is involved by a pathologic condition.

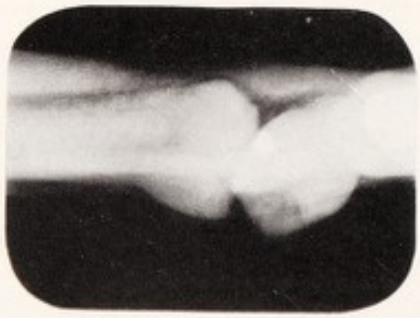
In the cases shown in Fig. 755, the greater part of the occlusal surface of the third molar impinges upon the distobuccal surface of the distal root of the second, and the ossistructure extends over the entire tooth. The pressure of the third molar has deflected the occlusal surface of the second upward beyond its normal alignment, and a comparison of the occlusal surface of the first molar with the corresponding surface of the second will reveal the extent of the deflection. After the extraction of the third molar the deflection of the occlusal surface of the second molar, the contact of the occlusal surface of the third molar with the distobuccal surface of the distal root of the second, and the trauma resulting from the operative procedure will usually make the retention of the second molar problematical.

Fig. 755. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Variation in root formation, with ossistructure extending over entire tooth. The greater part of occlusal surface of third molar is in contact with distal root of second. The occlusal surface of second molar is deflected upward beyond corresponding surface of first molar.

In a buccolingual deflection, where the crown of the third molar is in contact with the greater part of the apical third of the distal root of the second, it was found that, considering the various procedures that may be attempted in such a case, the exolever technic causes less trauma and is more dependable than any other procedure. The usual involvement, however, of the apical third of the distal root of the second molar presents the question of the value of the second molar on account of probable pressure absorption on the distal root of the second molar, and in some cases it is impossible to define such an involvement in the radiogram.

In the case shown in Fig. 756 A, where the mesial root is inclined distally and the distal root is inclined mesially, the ossistructure ex-

A



B

C

Fig. 756. — Horizontal Impaction—Buccolingual Deflection—Mesial Surface Inaccessible. Same case. *A*, mesial root inclined distally and distal root inclined mesially. Roots fused, with ossistructure on distal surface extending up to occlusal surface and over entire lingual and buccal surfaces. The second molar is deflected lingually, with first molar in approximately normal alignment. *B*, occlusal view, showing contact of occlusal surface of third molar extending almost up to bifurcation on buccal surface of second; *C*, socket after extraction.

tends over the entire distal, lingual and buccal surfaces. The second molar is deflected lingually, indicated by a part of the occlusal surface being visible while the first molar shows no part of its occlusal surface and is in approximately normal alignment. Excision on the distal surface to the gingival third and on the buccal surface is indicated to gain access with the exolever to the mesial surface. The operator should be guided while making the distal and buccal excisions by the occlusal radiogram shown in Fig. 756 B, which should also be used when applying the exolever blade in order to reach the mesial surface, as the radiogram shows that the contact of the occlusal surface has extended to the bifurcation on the buccal surface of the second molar. Figure 756 C shows the socket after extraction.

TORSIONAL DEFLECTION, WITH THE SURFACE THAT WOULD NORMALLY BE THE MESIAL SURFACE ACCESSIBLE

Not many cases are presented with the tooth in a torsional deflection, where the surface that would normally be the mesial is accessible, and cases are more frequently seen, with the tooth in a similar deflection, where the surface that would normally be the mesial is inaccessible.

CLINICAL EXAMINATION

Exposed Crown.—If a part of the crown is exposed, and such exposure is often the case, some definition as to the location of the buccal surface can be obtained with a probe or an explorer. Parts of the occlusal and distal surfaces are often exposed.

Gum Tissue.—The gum tissue usually extends over the surface that would normally be the distal to a point slightly beyond the gingival third, and may extend over part of the occlusal surface.

RADIOGRAPHIC INTERPRETATION

Crown.—The pulp chamber, which appears only as a small spot, is practically obliterated, and the enamel cap is not definitely shown. There is a variation in the location of the buccal surface, and the crown of the third molar may be in alignment with the crown of the second, or it may be deflected out of alignment buccally, lingually or buccolingually with the crown of the latter tooth.

Roots.—As a rule, no positive definition of the root formation can be obtained from the radiogram on account of the torsional deflection of the tooth.

Ossistructure.—The ossistructure extends up to the gingival third on the surface that would normally be the distal, and may extend slightly beyond that point. Pathologic changes usually involve the ossistructure below the surface that would normally be the mesial.

OPERATIVE TECHNIC

Gum Tissue Technic.—The exposed part of the tooth gives some definition of the alignment of the surfaces for the application of the exolever. An incision distally, along the surface that would normally be the buccal to a point that will permit the tooth to be directed upward and distally, is usually sufficient. Where the tissue on the surface that would normally be the buccal is liable to injury, incision is made downward and buccally on the distobuccal surface of the second molar.

Ossistructure Technic.—The excision of the ossistructure is made distally on the surface that would normally be the distal surface of the third molar to decrease resistance. The excision is made as described on page 625, and is confined to the surface that would normally be the distal. No excision is necessary to gain access to the surface that would normally be the mesial.

Exolever Technic.—When the buccal surface has been determined, its location is borne in mind during the operative procedure. If the buccal surface and bifurcation are at the surface that would normally be the distal, not a great deal of resistance will be encountered when the exolever movements are made upward and distally. Exolever No. 2L, 2R; No. 3L, 3R; No. 4L, 4R; or No. 7L, 7R is adjusted to the surface that would normally be the mesial, and the tooth is directed upward and distally, an exolever with a larger blade being used as the fulcrum is lost. This technic is indicated where the crown of the third molar is in alignment with the crown of the second; if there is a buccal deflection, the technic is the same as in a case of a buccal deflection where the mesial surface is accessible (page 657); if there is a lingual deflection, the technic is the same as in a case of a lingual deflection where the mesial surface is accessible (page 677); if there is a buccolingual deflection, the technic is the same as in a case of a buccolingual deflection where the mesial surface is accessible (page 690).

SUMMARY OF CASES

In the case shown in Fig. 757 the surface that would normally be the mesial is accessible, and excision of the ossistructure is made on the surface that would normally be the distal. The exolever is applied to the surface that would normally be the mesial, and the tooth is directed upward and distally. If the bifurcation of the roots is where the distal surface would normally be, no resistance will be presented. If, however, the bifurcation is not at the point mentioned, resistance will be encountered, and the tooth is then directed to a

point where it will be raised out of its socket; or, if the bifurcation is located, a buccal application of the exolever at the bifurcation may avoid a fracture of the roots.

TORSIONAL DEFLECTION, WITH THE SURFACE THAT WOULD NORMALLY BE THE MESIAL SURFACE INACCESSIBLE

A case of torsional deflection where the surface that would normally be the mesial is inaccessible is more frequently seen than a case where the surface that would normally be the mesial is accessible. A torsion with the tooth in a horizontal position, however, is not of frequent occurrence compared with the large number of horizontal impactions that are seen. In a torsional deflection the resistance is increased when the position of the roots is unfavorable for the exolever movements.

Fig. 757. — Horizontal Impaction — Torsional Deflection with Surface that Would Normally be Mesial Surface Accessible. No positive definition of root formation can be obtained with ossistructure on surface that would normally be distal extending up to gingival third and over part of surface that would normally be lingual or buccal.

CLINICAL EXAMINATION

Exposed Crown.—On a rare occasion a part of the crown is exposed.

Gum Tissue.—Usually the entire crown is covered by gum tissue, but sometimes a small part of the crown is exposed.

RADIOGRAPHIC INTERPRETATION

Crown.—There is usually an overlap of the occlusal surface of the third molar upon the distobuccal surface of the second, with a normal contact between the first and second molars. In the majority of torsional deflections, the tooth is deflected buccolingually, with a variation in the extent of occlusal surface that may be visible, and there is also a variation in the extent of the occlusal surface of the third molar that may be in contact with the distobuccal surface of the second. The pulp chamber is not definitely outlined, and appears only as a small spot. Occasionally there is a lingual or buccal deflection.

Roots.—As a rule, no positive definition of the root formation can be obtained from the radiogram on account of the torsional deflection of the tooth.

Ossistructure.—The ossistructure on the surface that would normally be the distal usually extends up to and slightly beyond the gingival third and may extend over the entire surface. There is a variation in the location of the ossistructure on the surface that would normally be the buccal, and the distance between the surface that would normally be the mesial should be compared with the superior border of the ossistructure along the buccal surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—If no part of the crown is exposed, some idea of the extent of the deflection of the surface that would normally be the buccal can usually be obtained by palpation, or from an occlusal radiogram. If a part of the crown is exposed, some definition can be obtained of the surface that would normally be the buccal. If there is no exposure of the crown, an incision is made on the distobuccal surface of the second molar, extending downward approximately to the surface that would normally be the mesial. The location of the surface that would normally be the buccal is determined with the lancet, and an excision is made distally along this surface to a point that will permit excision of the ossistructure on the surface that would normally be the distal. A slight incision is then made along the buccal half of the distal surface of the second molar.

Where there is a buccal deflection, the incision is made as described on page 664; a lingual deflection (page 681), and a buccolingual deflection (page 699).

Ossistructure Technic.—After the incision of the gum tissue has been made, ossisector No. 2L or 4L for the left side or No. 2R or 4R for the right side is selected and the gum tissue on the surface that would normally be the distal is displaced with the back of the blade. The blade is applied slightly distal to the ossistructure shown in the radiogram and directed toward the surface that would normally be the distal, excision being made to a point where this surface will be exposed down to the middle third of the distal root of the third molar, as described on page 639. When this excision has been made, ossisector No. 11L for the left side or No. 11R for the right side is selected, and the gum tissue on the surface that would normally be the buccal is displaced with the back of the blade, when the relation of the occlusal surface of the third molar to the distobuccal surface of the second is determined. In some cases access can be obtained as in the buccal deflection where part of occlusal sur-

face of the third molar is not in contact with the distal surface of the second, and the ossistructure anterior to that part of the occlusal surface that is out of alignment buccally with the distobuccal surface of the second molar is available for excision. By directing the ossisector toward that part of the occlusal surface of the third molar that is free of the buccal surface of the second down to the mesial surface of the third molar, excision on the surface that would normally be the buccal will be avoided, and excision is made as in a buccal deflection (page 665).

Where the crown is deflected lingually, an excision on the surface that would normally be the buccal is made as in a case of lingual deflection where the mesial surface is inaccessible (page 682). If it is observed that part of the occlusal surface of the third molar is in contact with the distobuccal surface of the second, the excision is made on the surface that would normally be the buccal, starting at the superior border of the ossistructure and extending down to a short distance above the mesial surface, as in a case of a buccolingual deflection where the mesial surface is inaccessible (page 702). There is often a space between the buccal surface and the ossistructure on this surface, and the exolever can be inserted into this space without excision of the ossistructure.

Exolever Technic.—Where the surface that would normally be the buccal surface of the third molar is in alignment with the buccal surface of the second, exolever No. 2L or 2R is applied to the mesial surface to direct the tooth upward and distally. Where exolever No. 7L for the left side or No. 7R for the right side can be directed along that part of the occlusal surface that is deflected buccally out of alignment with the distobuccal surface of the second molar to make an adjustment to the surface that would normally be the mesial, the exolever technic is the same as in a case of a buccal deflection where the mesial surface is inaccessible (page 667). If this procedure is not practicable and there is a lingual deflection, the exolever is applied to the surface that would normally be the buccal surface of the third molar deflected lingually out of alignment with the buccal surface of the second molar, after which the exolever is adjusted below the surface that would normally be the mesial surface of the third molar. The tooth is directed upward and distally, as in a case of lingual deflection where the mesial surface is inaccessible (page 684). Where the tooth is deflected buccolingually, the technic is the same as in a case of a buccolingual deflection where the mesial surface is inaccessible (page 705).

Where the roots are straight and the mesial surface is where the buccal surface would normally be, there will be practically no

resistance when the tooth is being directed upward and distally. Where the roots are not straight, the condition is not favorable for an exolever movement upward and distally, and there will be resistance of an extreme character. If sufficient incision has been made on the surface that would normally be the distal, the operator need not hesitate to direct the tooth upward and distally. When the third molar is clear of the distal surface of the second molar, exolever No. 10L for the left side or No. 10R for the right side, in an occasional case, can be adjusted at the bifurcation, as in the case where the third molar is in a torsional deflection with the tooth in a mesioangular position, and the bifurcation has been located after the tooth has been directed upward and distally. If this technic is not practicable, the tooth is directed upward and distally out of its socket.

SUMMARY OF CASES

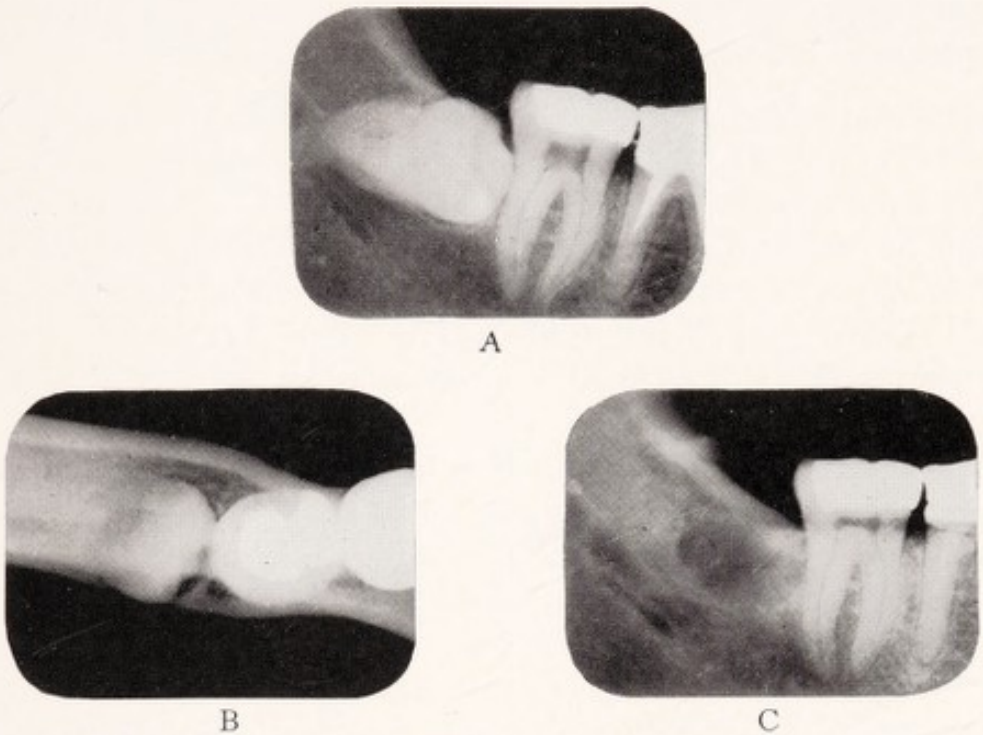
In the case shown in Fig. 758, where no positive definition of the root formation can be obtained from the radiogram, the pulp chamber has the appearance of a spot. The contact of part of the occlusal surface of the third molar with the distobuccal surface of the second is rather unusual, as in the majority of cases the overlap is shown at the gingival third of the second molar, whereas in the radiogram the overlap is above the gingival third of the second molar. The ossistructure on the surface that would normally be the distal

Fig. 758. — Horizontal Impaction — Torsional Deflection with Surface that Would Normally be Mesial Surface Inaccessible. No positive definition of root formation can be obtained, with ossistructure on surface that would normally be distal extending up to gingival third and over greater part of surface that would normally be lingual or buccal.

extends to the gingival third, and extensive excision to decrease resistance is made distally beyond this point. The surface that would normally be the mesial is not far from the superior border of the ossistructure, and excision on the surface that would normally be the buccal to gain access to the surface that would normally be the mesial is indicated, after which the tooth is directed upward and distally out of its socket.

In the case shown in Fig. 759, where there is a torsional deflection, with the occlusal surface of the third molar deflected lingually

and the surface that would normally be the buccal deflected lingually out of alignment with the buccal surface of the second molar, the condition is of a character not usually encountered in practice, and the three radiograms show respectively a lingual view, an occlusal view and a view of the case after extraction. Excision is made on the surface that would normally be the buccal and distal, and the exolever technic is the same as in a case of lingual deflection with the mesial surface inaccessible (page 684).



A B C

Fig. 759. — Horizontal Impaction — Torsional Deflection with Surface that Would Normally be Mesial Surface Inaccessible. Same case. *A*, no positive definition of root formation can be obtained on account of torsional deflection. The crown is deflected lingually, which is rather unusual in this type of impaction. *B*, occlusal view; *C*, case after extraction.

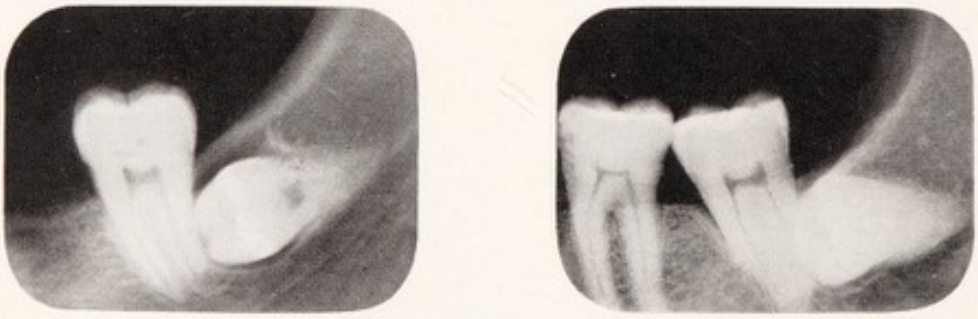
In the cases shown in Fig. 760 the ossistructure on the surface that would normally be the distal extends beyond the gingival third, being slightly involved by pathologic changes, and extensive excision to decrease resistance at this point is indicated. The surface that would normally be the mesial is quite a distance from the superior border of the ossistructure, and excision on the surface that would normally be the buccal is the same as in a case of buccolingual deflection (page 702). As the third molar in cases of this character is deflected buccolingually in addition to being in a torsional position, the degree of resistance of the roots that may be presented when the exolever movements are executed on account of the torsional deflection cannot be estimated.

In the case shown in Fig. 761 A the tooth is deflected buccolingually, and only a small part of the occlusal surface of the third molar is in

Fig. 760. — Horizontal Impaction — Torsional Deflection with Surface that Would Normally be Mesial Surface Inaccessible. No positive definition of root formation can be obtained on account of torsional deflection, with ossistructure on surface that would normally be distal extending beyond gingival third and entirely over surface that would normally be lingual or buccal.

contact with the distal root of the second. Pathologic changes involve the ossistructure on the surface that would normally be the distal, and extensive excision at this point is indicated. Quite an extensive excision on the surface that would normally be the buccal is indicated to obtain access to the surface that would normally be the mesial. The degree of resistance of the roots that may be presented when the exolever is applied is problematical, as is the case in all types of torsional deflection.

In the case shown in Fig. 761 B, where the overlap of the occlusal surface of the third molar upon the distal root of the second involves the middle third of the root, the pressure has involved the distal root of the second molar to such an extent that this tooth will be of little value to the patient after the extraction of the impacted tooth. In such a case the operator's decision as to the operative procedure is governed by the value of the second molar to the patient, the trauma that will result from the operation, the patient's physical condition, and the clinical findings. In this case the interseptum between the first and second molars is involved to such an extent that after the extraction of the impacted third molar the second will not be firmly attached to the supporting ossistructure.



A B

Fig. 761. — Horizontal Impaction — Torsional Deflection with Surface that Would Normally be Mesial Surface Inaccessible. No positive definition of root formation can be obtained on account of torsional deflection. *A*, ossistructure on surface that would normally be distal, which is slightly involved by a pathologic condition, extends up to occlusal surface and entirely over surface that would normally be lingual or buccal; *B*, ossistructure extends over entire tooth, with pathologic condition involving interseptum between first and second molars.

ISOLATED POSITION, WITH THE MESIAL SURFACE ACCESSIBLE

The radiogram in this type of case, as in other types, is of great value in enabling the operator to determine, in advance of the operative procedure, whether there is any interfering ossistructure present, and also to determine the alignment of the tooth and the character of the root formation. A fistulous opening in the gum tissue or the exposure through the gum tissue of a part of the occlusal or distal surface of the crown are the usual clinical findings. Any pathologic changes that may be present and the extent to which the ossistructure may be affected are readily defined in the radiogram.

Cases of this kind often interfere with an artificial denture, especially where there may be pressure from the plate over the crown. Locating the occlusal surface and observing the distance between the mesial surface and the superior border of the ossistructure are the diagnostic points to be observed, in addition to which the ossistructure over the occlusal surface and on the mesial, distal and buccal surfaces should be carefully examined. The roots should be examined to determine their formation.

CLINICAL EXAMINATION

Exposed Crown.—Parts of the occlusal and distal surfaces are usually visible.

Gum Tissue.—The gum tissue on the distal surface usually extends up to or slightly beyond the gingival third and also extends partially over the occlusal surface. This condition is examined when making the clinical examination, to determine the character of incision to be made, so that the gum tissue over the occlusal surface can be displaced with the exolever blade in order that an exolever may be adjusted below the mesial surface without causing any injury.

RADIOGRAPHIC INTERPRETATION

Crown.—The tooth, when not deflected lingually, will not show any part of the occlusal surface. When the tooth is deflected buccally, no definition of this deflection can be obtained in a lingual radiogram, but may be ascertained in the clinical findings when the gum tissue has been retracted or by an occlusal radiogram.

Roots.—The root formations that may occur in this class of impaction are similar to those seen in other types of horizontal impaction.

Ossistructure.—The ossistructure seldom extends beyond the gingival third. The greater parts of the buccal and mesial surfaces up to and sometimes beyond the gingival third, depending on the area involved by pathologic changes, are usually free of ossistructure.

OPERATIVE TECHNIC

Gum Tissue Technic.—Where the gum tissue covers parts of the occlusal and distal surfaces, it is incised by inserting the lancet in alignment with the occlusal surface and incising over this surface toward the buccal surface, when the lancet is directed buccally to the occlusal surface. The same procedure, followed on the lingual surface, allows the blade to displace the gum tissue from the occlusal surface to reach the mesial surface with the exolever. The incision on the distal surface is made distally, when indicated, in alignment with the center of this surface, to a point where excision of the ossistructure on this surface can be made, if necessary, so that the tooth can be directed upward and distally without causing injury to the gum tissue (Fig. 762)

Fig. 762. — Incision of Gum Tissue — Horizontal Impaction—Isolated Position—Mesial Surface Accessible. Incision along occlusal surface, which is extended buccally and lingually, and distally over center of distal surface.

Ossistructure Technic.—Where the ossistructure on the distal surface does not extend beyond the gingival third, no excision will be necessary on this surface; but, if the ossistructure extends beyond this point, excision is indicated, and ossisector No. 2L or 4L for the left side or No. 2R or 4R for the right side is selected. The ossisector is applied in alignment with the distal surface, and the gum tissue is displaced with the back of the blade (Fig. 763). The excision is made as for a distal excision (page 625), and sufficient ossistructure on the distal surface is excised to overcome any resistance that may be presented. As the ossistructure below the mesial surface is affected by pathologic changes, there will be no occasion for excision in this region.

Exolever Technic—Mesial Application.—The radiogram will show the extent of the mesial surface that is available for the application of the exolever and will also indicate the fulcrum that can be utilized

below the mesial surface. Exolever No. 8L for the left side or No. 8R for the right side is selected and directed downward over the occlusal surface, with the flat side engaging the occlusal surface and the round side displacing the gum tissue, until the point reaches the mesial surface (Fig. 764 A). The handle of the exolever is turned mesially (Fig. 764 B), and this will have the effect of directing the point of the blade below the mesial surface. The turning of the handle is continued until the blade is stopped by the ossistructure.

When the blade is inserted between the mesial surface and the ossistructure on this surface, a wedge is created that often loosens

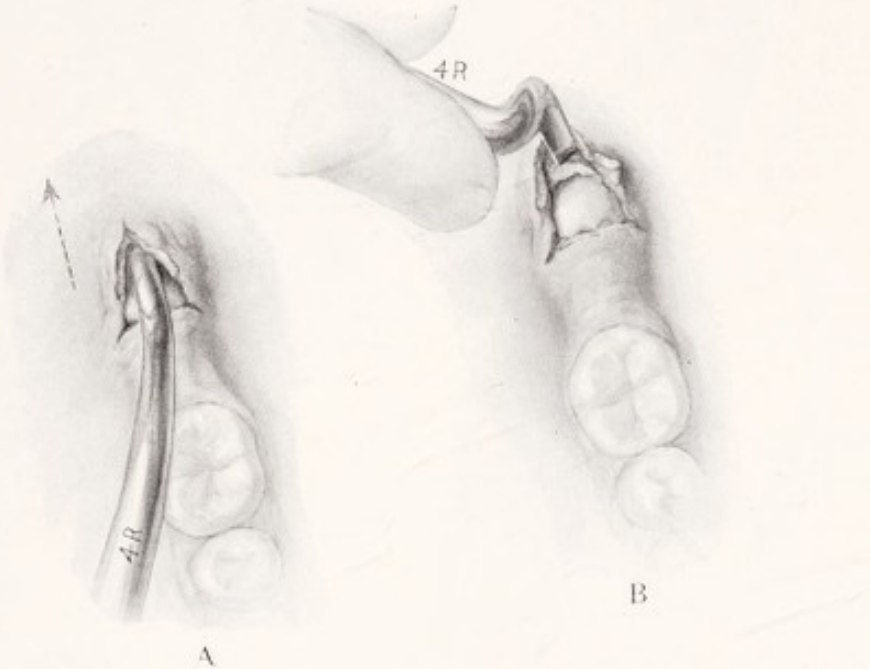


Fig. 763. — Displacing Gum Tissue—Horizontal Impaction—Isolated Position—Mesial Surface Accessible. *A*, ossisector No. 4R applied in alignment with distal surface and displacing gum tissue with back of blade; *B*, blade directed for excision of ossistructure.

the tooth. When the point of the blade is applied to and below the mesial surface, it should be kept in the center of this surface. The blade is of sufficient size to rest upon the ossistructure anterior of and below the mesial surface, provided the pathologic involvement is not too extensive. The handle of the exolever is turned mesially (Fig. 764 C), which movement will direct the tooth upward and distally out of its socket in conformity with the root formation. When the root formation is of such a character that the tooth can be directed to a point where it is in a mesioangular position, and a buccal application can be made, such a procedure is followed to complete the extraction.

Buccal Application.—Where both roots are fused or straight, a buccal application can be made independent of a mesial application, and then no excision is indicated on the distal surface. Exolever No.

10L or 10R is selected, and the gum tissue on the buccal surface is displaced with the back of the blade. The point of the blade is directed toward the bifurcation, and the blade is wedged between the ossistructure and the buccal surface. The handle is turned posteriorly and the tooth is directed mesially out of its socket. In Fig. 767, page 328, a case is detailed where the foregoing procedure was followed.

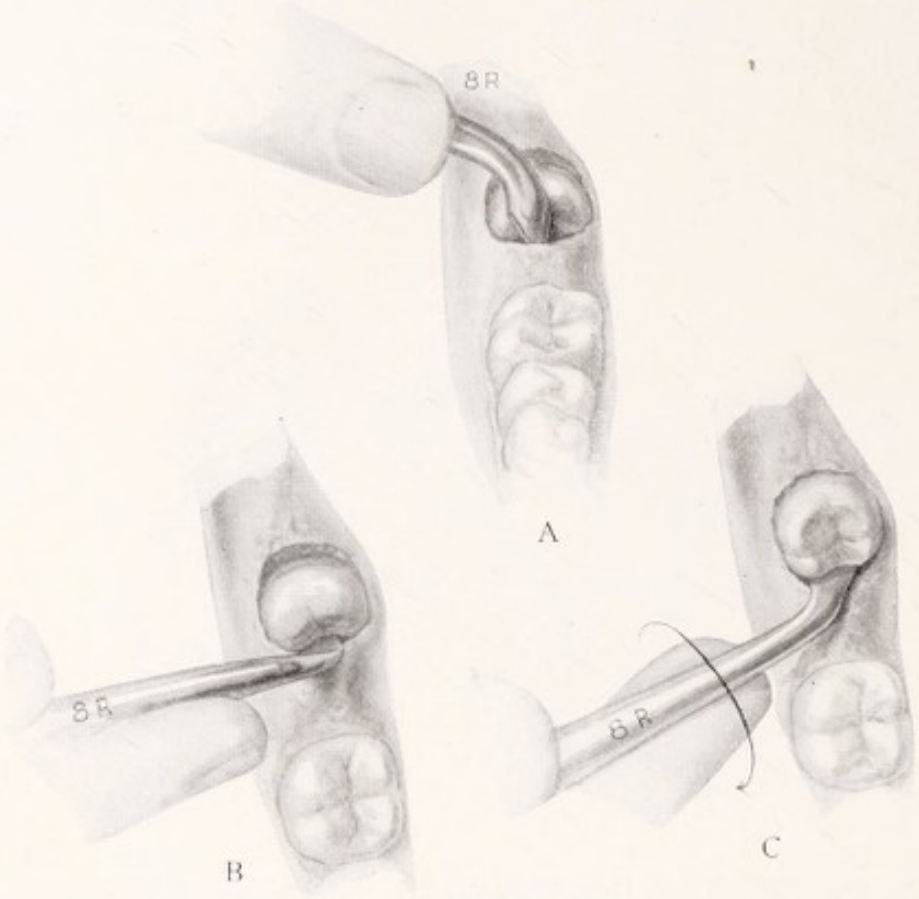


Fig. 764. — Mesial Application of Exolever — Horizontal Impaction — Isolated Position—Mesial Surface Accessible. *A*, exolever No. 8R applied along occlusal surface; *B*, handle turned mesially and blade directed below mesial surface; C, tooth being directed out of socket.

SUMMARY OF CASES

In the case shown in Fig. 765 A, where the roots are fused, no excision on the distal surface is indicated. Pathologic involvement is very extensive below the mesial surface, and the blade of the exolever is applied to the buccal surface where a secure fulcrum can be obtained. If, however, a fulcrum cannot be secured, excision is made beyond the involved area to obtain a suitable fulcrum, after which the tooth is directed mesially in line with its long axis.

In the case shown in Fig. 765 B the mesial root is straight and the distal root is inclined mesially at the apical third. In order to decrease any resistance that may be presented by the root formation, excision is made on the distal surface. Pathologic involvement is not so exten-

sive below the mesial surface as in the case shown in Fig. 765 A, and the initial application of the exolever is made to the mesial surface in order to direct the tooth upward and distally to overcome the resisting septum between the roots. As the distal root is inclined mesially at the apical third and there is a liability of a fracture, the tooth is directed upward and distally only far enough to place it in a mesioangular position and allow a buccal application of the exolever to complete the extraction.

A B

Fig. 765. — Horizontal Impaction — Isolated Position—Mesial Surface Accessible. *A*, roots fused, with ossistructure extending on distal surface to gingival third, and greater part of lingual and buccal surfaces free of ossistructure; *B*, mesial root straight and distal root inclined mesially at apical third, with ossistructure extending on distal surface to gingival third, and greater part of lingual and buccal surfaces free of ossistructure.

In the case shown in Fig. 766, where the mesial root is inclined distally and the distal root is inclined mesially, the ossistructure on the distal surface extends slightly beyond the gingival third, and excision is indicated on this surface. The slight area of pathologic involvement below the mesial surface will permit access to that surface, and the exolever is applied to the mesial surface to direct the tooth upward and distally to fracture the small septum between the roots, which procedure will direct the tooth to a distance where a buccal application can be made to complete the extraction.

Figure 767 A shows a lingual radiogram; Fig. 767 B shows an occlusal radiogram; Fig. 767 C shows a radiogram after extraction, and Fig. 767 D shows the extracted tooth, all made from the same case.

Fig. 766. — Horizontal Impaction—Isolated Position—Mesial Surface Accessible. Mesial root inclined distally and distal root inclined mesially with ossistructure extending beyond gingival third on distal surface and over greater part of lingual and buccal surfaces.

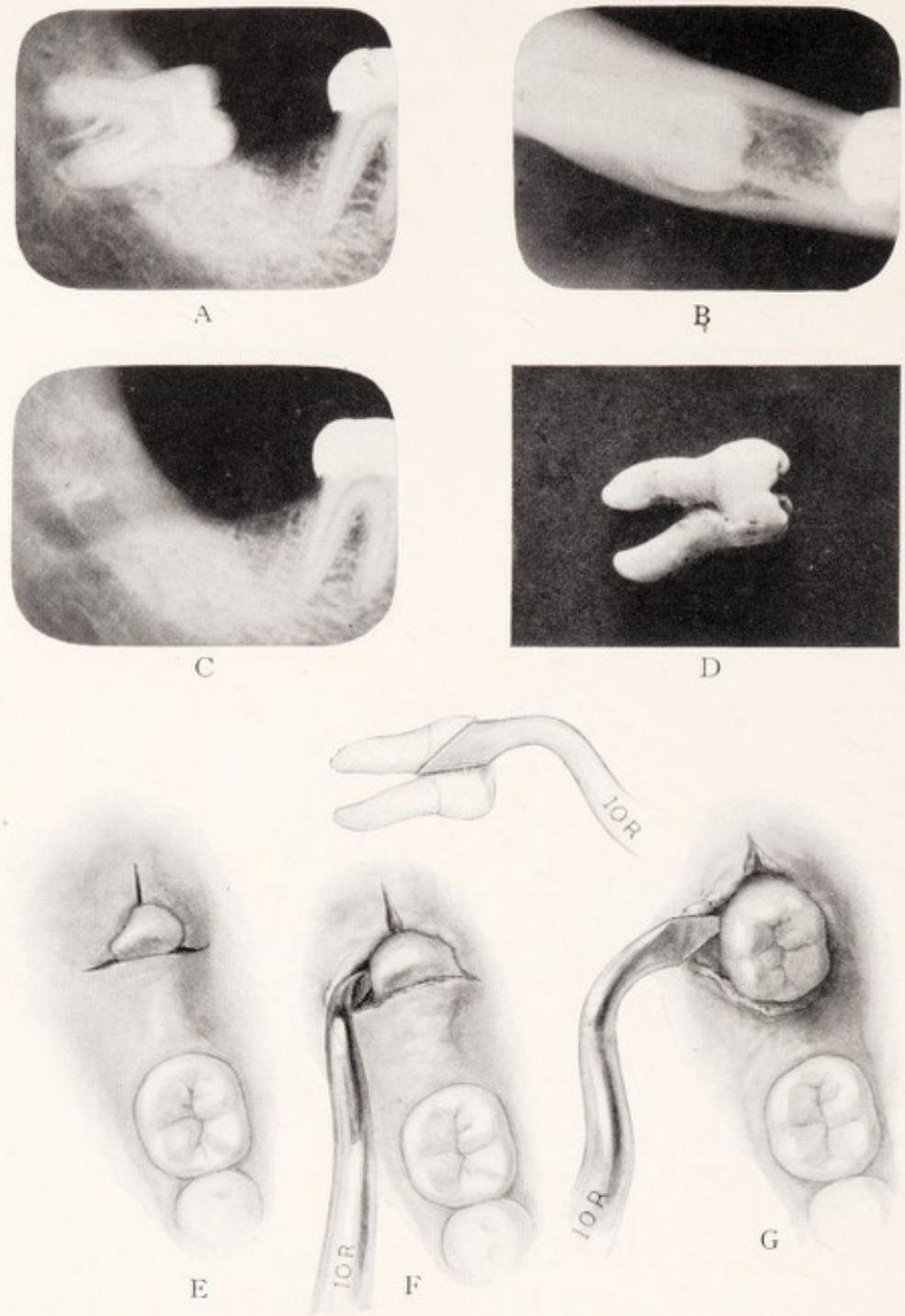


Fig. 767. — Horizontal Impaction—Isolated Position—Mesial Surface Accessible. *A*, both roots straight with a large septum between them, with ossistructure on distal surface extending slightly beyond gingival third; *B*, occlusal view of case; *C*, socket after extraction showing undisturbed septum between roots; *D*, extracted tooth; *E*, incision made along occlusal surface and extended to a slight extent lingually and buccally; *F*, exolever No. 10R displacing gum tissue with back of blade, which has been wedged between buccal surface and ossistructure; *G*, tooth directed mesially in line with its long axis.

In Fig. 767 A the lingual view shows both roots straight with a large septum between them, and the ossistructure on the distal surface extends slightly beyond the gingival third of the tooth, with no ossistructure extending over the occlusal surface. In order to eliminate excision on the distal surface as well as the application of the exolever

to the mesial surface, exolever No. 10L or 10R can be applied to the buccal surface. In Fig. 767 E is shown an incision made along the occlusal surface, which extends lingually and buccally in alignment with the latter surface, an incision is also made on the distal surface. The operator directs the blade, with pressure under control, toward the bifurcation, thereby creating a wedge between the buccal surface and the ossistructure (Fig. 767 F). By turning the handle to a slight extent posteriorly, the tooth can be directed forward out of its socket in line with its long axis (Fig. 767 G).

One should treat this case like a typical vertical impaction that is isolated, with both roots straight, directing the tooth out of its socket in line with its long axis, thereby decreasing trauma and lessening the number of applications of the instrument used. In this case only one application of the instrument, with repeated exolever movements, was necessary to complete the extraction.

ISOLATED POSITION, WITH THE MESIAL SURFACE INACCESSIBLE

More cases are seen where the tooth is isolated and the mesial surface is inaccessible to the immediate application of the exolever than where the surface is accessible, owing, no doubt, to the frequent occurrence of cases where the second molar has been extracted with the idea that it would simplify the extraction of the impacted third molar, or where the second molar has been involved by caries, pressure absorption or a pathologic condition, and is beyond restoration. There is, as a rule, no advantage in the extraction of the second molar in advance of the extraction of the third, and where the second molar has been recently extracted and regenerated ossistructure has not filled the socket, the condition is quite disadvantageous, as the ossistructure anterior to the occlusal surface will not, as a rule, make a secure fulcrum.

CLINICAL EXAMINATION

Exposed Crown.—As a rule, no part of the crown is exposed, but should there be any exposure, it will be the distoclusal surface.

Gum Tissue.—The description above in regard to the exposed crown will apply to the condition of the gum tissue.

RADIOGRAPHIC INTERPRETATION

Crown.—A careful study of the radiogram is made to determine whether there is a lingual deflection of the tooth. As previously stated, a buccal deflection cannot be determined where the tooth is isolated until the gum tissue has been retracted. Where the crown is not

deflected lingually, no part of the occlusal surface is visible and there is a definite enamel cap and pulp chamber, but in a lingual deflection a part of the occlusal surface is visible.

Roots.—The root formations that may occur in this class of impaction are similar to those seen in other types of horizontal impaction.

Ossistructure.—In some cases the ossistructure on the distal surface extends only up to the gingival third, and occasionally this structure may be involved by pathologic changes. In other cases the ossistructure on this surface often extends from the gingival third up to the occlusal surface. The superior border of the ossistructure is compared with the mesial surface, and this will give the operator a guide as to the extent of ossistructure to excise over the occlusal surface from the superior border down to the mesial surface, as this surface is inaccessible to the immediate application of the exolever.

OPERATIVE TECHNIC

Gum Tissue Technic.—If any part of the crown is exposed, the operator will have a guide as to the location of the occlusal surface. If, however, no part of the crown is exposed, the occlusal surface is determined by palpation, and if this procedure is not possible and the first molar is in position, the distance between the occlusal surface of the third molar and the distal surface of the first can be measured on the radiogram. Where there is no anterior tooth that can be taken as a guide, a small metal pin that has been sterilized can be inserted into the gum tissue in what would be approximately the location of the occlusal surface, the pin being forced as far as the ossistructure will permit. A radiogram is then made with the pin in place, and the location of the pin in the gum tissue is compared with the radiogram, the operator thus being given the exact location of the occlusal surface for the purpose of determining the point of incision. When the occlusal surface has been located, the point of the lancet is directed downward between the occlusal surface and the gum tissue on this surface, following the occlusal surface from the buccal surface to the lingual surface until the instrument strikes the superior border of the ossistructure. When the lancet has passed between the occlusal surface and the ossistructure on this surface to free this part of the crown, a slight incision is made buccal to the occlusal surface, the extent of the incision being governed by the size of the flap desired. A similar incision is made on the opposite side from the occlusal surface to slightly beyond the lingual surface.

Where the mesial surface is quite a distance from the superior border of the ossistructure, and excision over the occlusal surface is indicated in order to reach the mesial surface, a larger flap thus

being required, an incision extending anteriorly from the buccal surface is made in line with this surface. A similar incision is made on the lingual surface, extending anteriorly to a point where the tissue over the occlusal surface can be readily displaced for the purpose of excising the ossistructure and applying the exolever. On completion of the operation the flaps will return to their original position.

Where the ossistructure on the distal surface extends only up to the gingival third and where pathologic changes involve the structure at this point, an incision is made distally, in line with the center of the distal surface of the third molar, sufficient to permit the excision of the ossistructure at this point and to direct the tooth upward and distally. Where the ossistructure covers the greater

Fig. 768. — Gum Tissue Incision — Horizontal Impaction — Isolated Position—Mesial Surface Inaccessible. Incision along occlusal surface, which is extended buccally and lingually to latter surface, anterior to occlusal surface in line with buccal and lingual, incising distally along buccal surface.

part of the crown or extends over the entire distal surface, the incision is made along the buccal surface, the operator bearing in mind any lingual deflection, and the alignment of the buccal surface is followed distally to a point that will permit excision of the ossistructure on the distal surface (Fig. 768). The latter incision is also indicated when the operator intends to apply the exolever to the mesial surface from the buccal surface.

Ossistructure Technic—Distal Excision.—Where the ossistructure on the distal surface extends only up to the gingival third and is involved by a pathologic condition, usually no excision at this point is indicated unless the operator wishes to decrease resistance further. Where the ossistructure extends beyond the gingival third up to the occlusal surface, excision is indicated and is made as described on page 639. The gum tissue on the distal surface is displaced with

the back of the blade, and the blade is directed distally toward the ossistructure on the distal surface, where excision is made until the ossistructure on this surface is excised to a point where resistance will be decreased.

Buccal Excision.—Excision is not, as a rule, indicated on the buccal surface unless the mesial surface is quite a distance from the superior border of the ossistructure, and when the exolever is adjusted to the mesial surface by an occlusal approach, it is a question of whether the tooth can be raised up to the superior border or whether the exolever movements upward and distally can be made more advantageously by utilizing as a fulcrum the ossistructure along the buccal surface. If the latter procedure is to be followed, excision is made

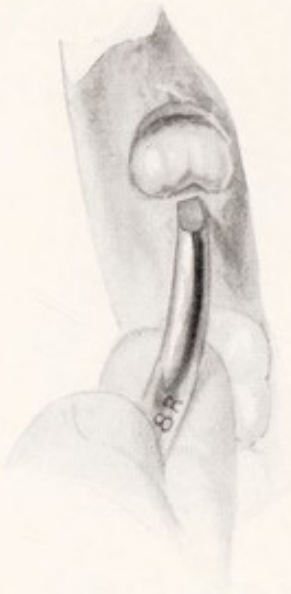


Fig. 769. — Occlusal Excision of Ossistructure — Horizontal Impaction—Isolated Position—Mesial Surface Inaccessible. Ossisector No. 8R applied for excision of ossistructure over occlusal surface.

on the buccal surface from the superior border, and extended down on this surface to a point where the superior border of the ossistructure can be used as a fulcrum, as described for a buccal excision (page 641). Where the ossistructure has been excised over the occlusal surface and the mesial surface is not located very far from the superior border, the root formation being favorable for a buccal application of the exolever independent of a mesial adjustment where the structure interferes with a buccal application, excision on the buccal surface is made with ossisector No. 11L or 11R at or distal to the bifurcation where the adjustment is indicated after the tooth has been directed upward and distally.

Occlusal Excision.—The radiogram will show the amount of ossistructure over the occlusal surface, and excision is made with ossisector No. 8L for the left side or No. 8R for the right side. The

gum tissue over the occlusal surface is displaced with the back of the blade, and the operator directs the blade toward the occlusal surface slightly anterior to the part to be excised, starting in the center of the occlusal surface (Fig. 769) and excising down to the mesial surface, continuing lingually toward the lingual half and then toward the buccal half of the occlusal surface. Excessive excision anterior to the occlusal surface is to be avoided, and only sufficient excision is made to permit exolever No. 8L for the left side or No. 8R for the right side to enter the space between the occlusal surface and the ossistructure anterior to the surface and to permit the exolever to be inserted under the mesial surface.

Where the ossistructure extends over the greater part of the

Fig. 770. — Mesial Application of Exolever — Horizontal Impaction — Isolated Position—Mesial Surface Inaccessible. Exolever No. 7R displacing gum tissue on buccal surface, blade being directed below mesial surface.

occlusal surface, several ossisectors of the same design should be available, as the blade of this instrument is easily dulled when it strikes the enamel surface. The operator should be certain that no part of the ossistructure remains over the occlusal surface, as it will cause resistance.

When the second molar has been recently extracted and the empty socket can be entered with the ossisector without interference, the blade is passed over the occlusal surface, such ossistructure as remains over this surface being excised.

Exolever Technic—Mesial Application.—After the excision of the ossistructure has been made, exolever No. 8L for the left side or No. 8R for the right side is selected. The gum tissue over the occlusal surface is displaced with the back of the blade, the blade is applied along the occlusal surface, and the point is directed toward the mesial surface, when the handle of the exolever is turned mesially and the blade is applied beneath the mesial surface When the blade

reaches this point, the handle of the exolever is turned farther mesially, and the ossistructure anterior to and below the mesial surface is used as a fulcrum. The tooth is directed upward and distally in conformity with the root formation, as illustrated in Fig. 764, page 736. Where the tooth is depressed to a considerable extent, it is raised with the exolever to a point where the superior border of the ossistructure is reached, when exolever No. 7L for the left side or No. 7R for the right side is selected. The blade is applied to the buccal surface, the gum tissue being placed over this surface, and is then directed between the mesial surface and the superior border of the ossistructure (Fig. 770). The operator completes the extraction by directing the handle downward and then turning the blade of the exolever mesially. One can also use this exolever for a mesial application where there is quite a distance between the mesial surface and the superior border of the ossistructure by applying the blade along the occlusal surface, and then directing the handle mesially in order that the blade may be applied below the mesial surface to direct the tooth upward and distally. The latter procedure, however, should not be used where the mandibular canal is in close proximity to the mesial surface.

Buccal Application.—Where the mesial surface is located a short distance from the superior border of the ossistructure, and the ossistructure over the occlusal surface has been excised and the tooth can be directed mesially in line with its long axis, a buccal application can then be made with exolever No. 10L or 10R, as illustrated in Fig. 767, page 738.

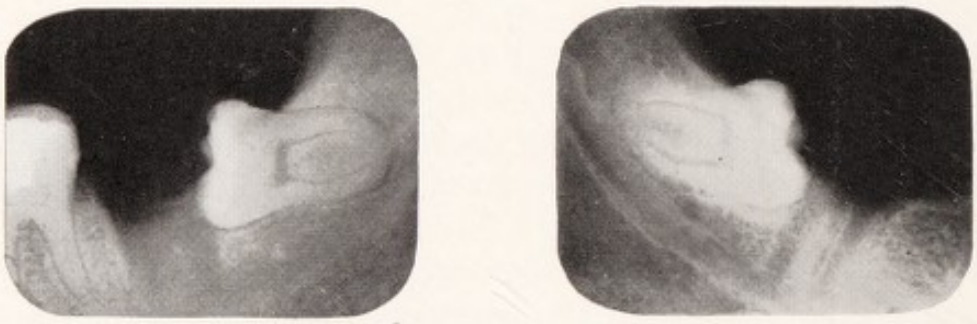


Fig. 771. — Horizontal Impaction—Isolated Position—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially. The ossistructure on distal surface extends to gingival third and over greater part of lingual and buccal surfaces. Mesial surface of third molar may be reached through second molar socket as a result of recent extraction.

SUMMARY OF CASES

In Fig. 771 are shown cases where the second molar has been recently extracted, leaving the socket so that the blade of an ossisector can be inserted for excision over the occlusal surface. In

these cases, however, excision of the ossistructure below the mesial surface is not indicated to gain access with the exolever to this surface. The ossistructure along the buccal surface is used as a fulcrum after the tooth has been directed partially upward and distally, as the ossistructure anterior to the occlusal surface will not serve for that purpose.

In Fig. 772 a pathologic condition has slightly involved the ossistructure on the distal surface. Excision is indicated on that surface to decrease resistance, and also slightly over the occlucal surface. The exolever is adjusted to the mesial surface, and the tooth is directed upward and distally to complete the extraction, or to a distance where a buccal application can be made.

Fig. 772. — Horizontal Impaction—Isolated Position—Mesial Surface Inaccessible. Mesial root inclined distally and distal root inclined mesially and fused. The ossistructure on distal surface is involved by pathologic condition to gingival third, and extends over part of occlusal surface, entire mesial surface and greater part of lingual and buccal surfaces.

In the cases shown in Fig. 773 there is a variation in the lingual deflection of the tooth. The ossistructure on the distal surface extends up to the occlusal surface, and the lingual deflection of the tooth should be borne in mind when excising on this surface. The greater part of the occlusal surface is covered by ossistructure, and the excision over this surface extends from the superior border of the ossistructure down to the mesial surface. The exolever is adjusted below the mesial surface in order to direct the tooth upward and distally, and the extent of the lingual deflection should receive proper consideration.

Fig. 773. — Horizontal Impaction—Isolated Position—Mesial Surface Inaccessible. Variation in root formation and ossistructure, with a slight lingual deflection of crown.

In the case shown in Fig. 774 A the tooth is deflected lingually. The root formation is of an extreme type, the roots being hypercementosed, and a great deal of resistance will be presented when the exolever is applied to the mesial surface. Excision, however, is made on the distal surface to a point where resistance will be decreased, and all ossistructure over the occlusal surface is excised. The exolever is adjusted to the mesial surface, and the tooth is directed upward and distally to a point where the superior border of the ossistructure along the buccal surface can be utilized as a fulcrum.

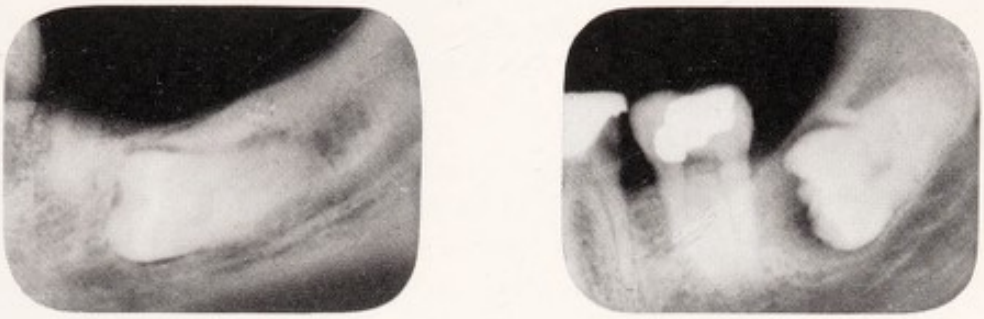
In the case shown in Fig. 774 B there is a torsional deflection of the tooth, indicated by the lack of definition of the pulp chamber, pulp canal and root formation. The ossistructure over the surface that would normally be the distal is excised beyond the gingival third. The excision over the occlusal surface is made to the surface that would normally be the mesial, and an adjustment of the exolever is made to the surface that would normally be the mesial to direct the tooth upward and distally.

A B

Fig. 774. — Horizontal Impaction—Isolated Position—Mesial Surface Inaccessible. *A*, roots hypercementosed and large. The ossistructure extends over entire distal surface, greater part of occlusal and entire mesial, lingual and buccal surfaces. The crown is deflected to a slight extent lingually. *B*, no positive definition of root formation can be obtained on account of torsional deflection of tooth. The ossistructure on surface that would normally be distal extends up to gingival third and over entire occlusal, and surfaces that would normally be mesial, lingual and buccal.

In the case shown in Fig. 775 A, where the distal surface is below the superior border of the ossistructure, the gum tissue over the occlusal surface and on the distal surface is incised, and the excision of the ossistructure is initially made over the occlusal surface instead of on the distal. As the ossistructure anterior to the occlusal surface is usually of a cancellous nature, it is not, as a rule, difficult to excise, and after the ossistructure over the occlusal surface has been excised down to the mesial, the excision on the distal surface is simplified by the operator starting the excision anteriorly to the occlusal surface, and continuing distally until sufficient ossistructure has been excised to decrease resistance at this point. The exolever, when adjusted to the mesial surface, should direct the tooth upward

to a distance where the superior border of the ossistructure along the buccal surface can be utilized as a fulcrum. Where the mandibular canal is in close relation with the mesial surface, excision should not extend below the mesial surface. The blade of the exolever engages the cusps of the tooth, instead of the mesial surface, the anterior ossistructure being utilized as a fulcrum, to direct it upward and distally, and repeated applications are often necessary. A downward pressure should not be exerted upon the tooth at any time.



A B

Fig. 775. — Horizontal Impaction—Isolated Position—Mesial Surface Inaccessible. *A*, mesial root inclined distally and distal root inclined mesially, with ossistructure extending over entire tooth; *B*, tooth is practically isolated from second molar, with occlusal surface some distance from distal surface of second molar. The ossistructure extends over greater part of distal surface, with a pathologic condition around crown of tooth.

In the case shown in Fig. 775 B, where the occlusal surface of the third molar is quite a distance from the distal surface of the distal root of the second, the technic is the same as in the case of an isolated tooth. The position of the third molar will not interfere when excising over the occlusal surface to gain access to the mesial surface, or when the exolever is applied to the third molar. In these cases a pathologic condition usually involves the ossistructure anterior to the occlusal surface, and in the application of the exolever care should be taken to avoid coming in contact with the mandibular canal. On account of the depression of the mesial surface, excision is made on the buccal surface in order that the superior border of the ossistructure on that surface may be utilized as a fulcrum.

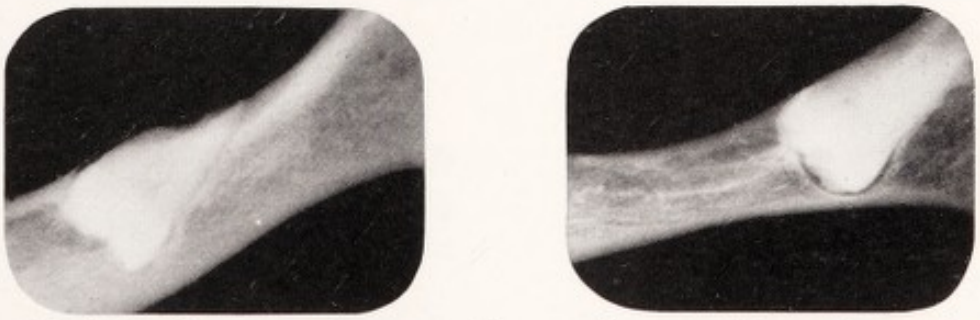


Fig. 776. — Horizontal Impaction—Isolated Position—Mesial Surface Inaccessible. Variation in root formation, with crown of tooth in close proximity to lower border of mandible.

In the cases shown in Fig. 776 there is no change in the technical procedure, except that, in case the patient is of advanced age, greater consideration is given to the mandible, as any undue pressure upon the mandible is liable to cause a fracture. One should make the excision very cautiously, applying very little pressure and excising gradually. In most cases no great dependence should be placed on the exolever technic, but reliance should be placed primarily on excising the greater part of the ossistructure that may cause resistance.

CHAPTER XX

Operative Technic in Linguoangular Impaction

WHERE it is shown by the clinical examination and radiographic interpretation that the mandibular third molar is impacted in a linguoangular position, the technic for extraction, when such a procedure is indicated, should be executed in conformity with the position of the tooth, its root formation, its supporting ossistructure and its relation to the second molar. The characteristic distinction of this deflection, as shown in the radiogram, is that the greater part of the occlusal surface is visible and there is a foreshortening of the roots. When this condition is presented, a second radiogram of the case is made to obtain a correct definition of the root formation. If the radiogram shows an elongation of the roots of the first, second and third molars, indicating that the radiogram has not been correctly made, it may cause the tooth to be mistaken for a case of typical vertical, mesioangular or distoangular impaction, as the entire length of the tooth can be defined in the radiogram, although the first, second and third molars may be elongated. When the radiogram is not made in accordance with the standard procedure, the linguoangular deflection of the tooth is not ascertained until the gum tissue over the crown has been incised. The greater number of cases of linguoangular impaction verge on a vertical position of the tooth. Sometimes the tooth is in a mesioangular and at other times in a distoangular position. Cases are also seen where the tooth, instead of being in a linguoangular position, is in a complete lingual position, with the occlusal surface of the third molar in a vertical position, and such a deflection is termed a complete lingual impaction, which condition is described on page 763.

In the majority of cases the mesial surface is accessible to the immediate application of the exolever, and the cases where the mesial surface is inaccessible should be distinguished from those cases where this surface is accessible.

LINGUOANGULAR DEFLECTION, WITH THE MESIAL SURFACE ACCESSIBLE

Where the mandibular third molar is impacted in a linguoangular position and the mesial surface is accessible, the radiogram is studied to determine the extent of mesial surface that may be available for

the application of the exolever. The interproximal space between the second and third molars is given special consideration, as it varies in size, and an exolever with a blade that will properly fit the space is selected, as trial applications and tentative exolever movements should be avoided so as not to endanger the second molar, which is to be used as a fulcrum.

CLINICAL EXAMINATION

Exposed Crown.—The entire crown is usually covered by gum tissue, but occasionally the buccoclusal surface is exposed.

Gum Tissue.—If no part of the crown is exposed, some idea of the position of the tooth for determining the incision to be made can be gained by palpation or by the bulging of the gum tissue over the crown. The bulging is usually at the occlusal surface of the third molar, which may be in alignment with the lingual surface of the second molar, or is between that point and the center of the distal surface.

RADIOGRAPHIC INTERPRETATION

Crown.—The greater part of the occlusal surface is visible, and the radiogram shows a foreshortening of the roots. No part of the occlusal surfaces of the first and second molars is visible, and there is a normal contact between these teeth. These diagnostic points indicate a linguoangular position of the third molar.

Roots.—The roots are shown to be foreshortened, and a second radiogram is made to obtain a correct definition of the root formation, which procedure is described on page 19. There are, however, occasional cases where the lingual deflection of the tooth is rather marked and all of the root formation is not fully defined in the radiogram, but sufficient definition is presented to give some idea of the formation of the roots as a guide for the execution of the exolever movements in conformity with the root formation. The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: partially developed roots, 7; both roots straight, 5; both roots inclined distally, 2; mesial root inclined distally and distal root straight, 2; fused roots, 2, and divergent roots, 2.

Ossistructure.—The mesial surface is accessible to the application of the exolever and no excision of the ossistructure on this surface is indicated. The ossistructure on the distal surface usually extends up to and may extend over the occlusal surface, being occasionally involved by a pathologic condition. The radiogram should be studied carefully, and the amount of ossistructure over the occlusal and on the distal surfaces can be readily determined. The decided lingual

deflection of the occlusal surface has the effect of deflecting lingually the buccal surface of the crown, and this has a tendency to decrease the thickness of the ossistructure on this surface. Excision of the ossistructure on the latter surface is occasionally indicated to secure a suitable fulcrum.

OPERATIVE TECHNIC

Gum Tissue Technic.—From a partial exposure of the crown, or by palpating where there is no such exposure, the position of the buccoclusal surface of the third molar can be determined. The first incision is made from the distal surface of the second molar over the buccoclusal surface, the incision extending distally to a point that will permit excision of the ossistructure over the occlusal surface and on the distal surface. A second incision is made along the buccal half or the entire distal surface of the second molar from the lingual to the buccal surface, and this will permit the flap on the buccal surface to be displaced and allow the exolever to be adjusted to the mesial and buccal surfaces (Fig. 777).

Fig. 777. — Gum Tissue Incision—Linguoangular Impaction,— Mesial Surface Accessible. Incision distally along buccoclusal surface and on buccal half of distal surface of second molar.

Ossistructure Technic.—Excision of the ossistructure on the distal surface, when indicated, is made as in a vertical impaction (page 342), mesioangular impaction (page 467) or distoangular impaction (page 584), with a lingual deflection in each case, the excision being confined to the distal surface, which excision, as a rule, is readily made, but the approach is not so easily accomplished on account of the difficulty of access. Where the ossistructure extends over the occlusal surface, the excision is made as in a vertical impaction where there is a lingual deflection (page 420). In occasional cases the ossistructure on the buccal surface of the third molar is not very heavy, and will not make as suitable a fulcrum as where this surface is in alignment with the corresponding surface of second molar. Excision of the ossistructure

is made with ossisector No. 11L for the left side or No. 11R for the right side, and the deflection of the tooth will govern the direction for the application of the blade. The operator starts the excision at the superior border of the ossistructure and excises slightly distal to the bifurcation downward to a point where a secure adjustment of the exolever can be obtained on the buccal surface at the bifurcation (page 432).

Exolever Technic.—The exolever technic is not different from that in a vertical impaction (page 421), mesioangular impaction (page 610) or distoangular impaction (page 526), with a lingual deflection in each case. Exolever No. 2L for the left side or No. 2R for the right is selected, as the blade is small and too large a blade should not be employed. When the gum tissue on the buccal surface has been displaced with the exolever, the blade is directed between the second and third molars, but the decided lingual deflection of the tooth will allow only a limited part of the distal surface of the second molar to be used as a fulcrum. The flat side of the blade is securely adjusted to the mesial surface, while the round side engages the second molar as a fulcrum. The operator exerts sufficient force to direct the tooth distally and upward in conformity with the root formation. When the tooth has not been extracted by the procedure described above, the operator completes the extraction movements with exolever No. 10L for the left side or No. 10R for the right side, making the adjustment to the buccal surface at the bifurcation, and using the superior border of the ossistructure along the buccal surface as a fulcrum, when the tooth is directed upward and lingually, being kept under control and not permitted to drop into the mouth. Where there is a contact of the roots, the exolever should not be applied to the mesial surface, in which case the operator makes the adjustment to the mesiobuccal surface, using exolever No. 9L or 9R as described for a mesiobuccal application (page 368). Usually where there is a contact of the roots there is a large space between the second and third molars to permit the application described above to be made.

SUMMARY OF CASES

In Fig. 778 are shown two radiograms of the same case. In Fig. 778 A the greater part of the occlusal surface is visible, but very little of the root formation is shown, and in Fig. 778 B the entire root formation is shown. Excision of the ossistructure on the distal surface is indicated, but no excision on the mesial or buccal surface is indicated. There should be very little resistance from the root formation when the exolever movements are executed, and a mesial and buccal application is made to complete the extraction.

A B

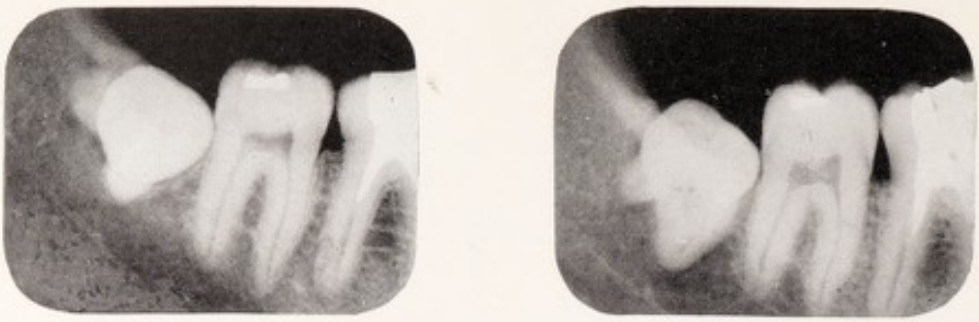
Fig. 778. — Linguoangular Impaction — Mesial Surface Accessible. Same case. *A*, radiogram made in standardized position, with greater part of occlusal surface visible and a foreshortening of roots; *B*, second radiogram made to detail root formation.

In Fig. 779 are shown two radiograms of the same case. In Fig. 779 A the greater part of the occlusal surface is visible, but very little of the root formation is shown, and in Fig. 779 B the entire root formation is shown. Excision of the ossistructure over the disto-clusal surface and on the distal and buccal surfaces is indicated. The exolever is applied to the mesial surface to direct the tooth distally in conformity with the root formation, and the extraction is completed by a buccal application.

A B

Fig. 779. — Linguoangular Impaction—Mesial Surface Accessible. Same case. *A*, radiogram made in standardized position, with greater part of occlusal surface visible and a foreshortening of roots; *B*, second radiogram made to detail root formation.

In Fig. 780 are shown two radiograms of the same case, where, in addition to the tooth being in a linguoangular position, there is a mesio-angular deflection. In Fig. 780 A the greater part of the occlusal surface is visible and a foreshortening of the roots is shown, and in Fig. 780 B the character of the root formation is shown. Excision is indicated on the distal surface and a slight excision is also indicated on the buccal surface distal to the bifurcation. An exolever with a small blade is selected for the initial application. There should be no difficulty in applying the exolever to the mesial surface to execute the exolever movements indicated by the root formation, and the extraction is completed by a buccal application.



A B

Fig. 780. — Linguoangular Impaction—Mesial Surface Accessible. Same case. *A*, radiogram made in standardized position, with greater part of occlusal surface visible and a foreshortening of roots; *B*, second radiogram made to detail root formation.

In Fig. 781 are shown two radiograms of the same case. In Fig. 781 A is shown the case before, and in Fig. 781 B the case after, the operation. The linguoangular position of the tooth, with a disto-angular deflection and with the mesial root of the third molar in contact with the distal root of the second, is liable in this case to endanger the latter tooth. Excision of the ossistructure over the distoclusal surface and on the distal and buccal surfaces is indicated. The available mesiobuccal surface of the third molar, which in this case is quite a distance from the distal surface of the second molar, will allow the application of exolever No. 9L for the left side or No. 9R for the right side on the mesiobuccal surface, thereby avoiding the use of the second molar as a fulcrum. The tooth is directed to a slight extent distally, the ossistructure in the location of the mesiobuccal surface being used as a fulcrum, and the extraction is completed by a buccal application. In the radiogram made after extraction is shown the apical third of the distal root of the second molar free of ossistructure owing to the contact of the roots, which also shows there has been no disturbance of the second molar. When excising the ossistructure over the distoclusal surface the excision is made by directing the blade of the ossisector between the occlusal surface and the structure over this surface.

A B

Fig. 781. — Linguoangular Impaction — Mesial Surface Accessible. Same case. *A*, contact of roots of second and third molars; *B*, socket after extraction.

LINGUOANGULAR DEFLECTION, WITH THE MESIAL SURFACE INACCESSIBLE

A case where the mandibular third molar is impacted in a linguoangular position and the mesial surface is inaccessible is not frequently seen, and the technic in such cases will not differ materially from a case where the mesial surface is accessible, except that in the former case excision is necessary in order to gain access for the application of the exolever to the mesial surface.

CLINICAL EXAMINATION

Exposed Crown.—No part of the crown is exposed.

Gum Tissue.—The gum tissue extends over the entire crown.

RADIOGRAPHIC INTERPRETATION

Crown.—The greater part of the occlusal surface is visible. No part of the occlusal surfaces of the first and second molars is visible and there is a normal contact between these teeth.

Roots.—The roots are shown to be foreshortened, and a second radiogram should be made to obtain a correct definition of the root formation. The root formations that may occur in this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root straight, 7; mesial root inclined distally and distal root inclined mesially, 3; fused roots, 3; both roots straight, 2, and partially developed roots, 2.

Ossistructure.—The mesial surface is inaccessible on account of being below the superior border of the ossistructure. The ossistructure on the distal surface usually extends up to the occlusal surface; in an occasional case it extends over the distoclusal surface, and it may extend over the lingual half of the occlusal surface. The ossistructure on the buccal surface usually extends over the greater part of this surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—Incision is made to gain access with the ossisector to the mesial, distal, occlusal and buccal surfaces, and to allow the exolever to be applied to the mesial and buccal surfaces. The incision is made as in the case where the mesial surface is accessible (page 751).

Ossistructure Technic.—Excision on the distal surface is made as in a vertical impaction with a lingual deflection (page 432). Where the ossistructure extends over the distoclusal surface, the excision is made as in a vertical impaction where there is a lingual deflection

(page 439). Where the ossistructure extends over the lingual half of the occlusal surface the excision is made as described for a lingual deflection (page 420). Excision on the buccal surface is indicated to secure an adjustment of the exolever for a buccal application, which is described on page 432. The excision to gain access to the mesial surface is made by directing the ossisector between the second and third molars, care being taken not to endanger the distal root of the second molar. There will usually be a space between the mesial surface of the third molar and the ossistructure on this surface that will permit the insertion of ossisector No. 7L or 11L for the left side or No. 7R or 11R for the right side. If, however, no space exists, excision is made on the mesial surface, which excision is not difficult to execute on account of the cancellous nature of the ossistructure. The excision is practically the same as that described for a vertical impaction where there is a lingual deflection and the mesial surface is inaccessible (Fig. 458, page 434).

SUMMARY OF CASES

In Fig. 782 are shown two radiograms of the same case, where the mesial surface is inaccessible. The radiograms show the close relationship between the mesial surface of the third molar and the gingival third of the distal surface of the second molar, and the case should be examined to determine the excision to be made over the distoclusal

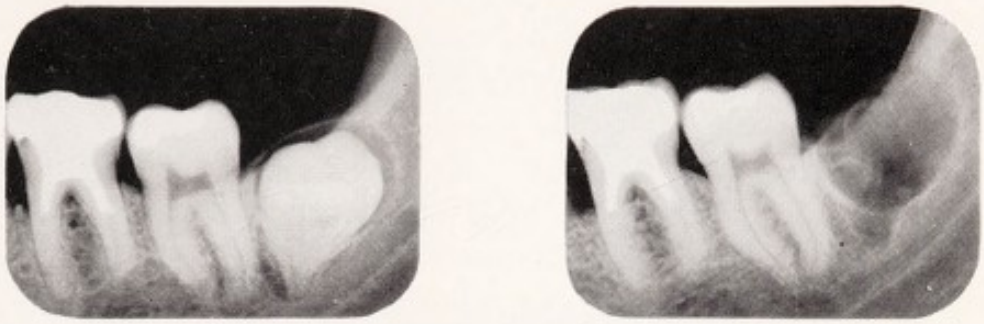
A B

Fig. 782. — Linguoangular Impaction—Mesial Surface Inaccessible. Same case. *A*, radiogram made in standardized position, with greater part of occlusal surface visible and a foreshortening of roots; *B*, second radiogram made to detail root formation.

surface and on the mesial, distal and buccal surfaces. The exolever is applied to the mesiobuccal surface, and the ossistructure at this point is utilized as a fulcrum. As both roots are straight, the tooth is directed only to a slight extent distally, and dependence is placed on a buccal application to complete the extraction.

In the case shown in Fig. 783 A, where the roots are partially developed and the ossistructure extends over the entire tooth, excision is indicated over the entire occlusal surface, and on the buccal

surface in alignment with the bifurcation. No excision is indicated on the distal or mesial surface, as the extraction, on account of the character of the root formation, can be executed with a buccal application of the exolever to direct the tooth upward and lingually. Fig. 783 B shows the socket after extraction.



A B

Fig. 783. — Linguoangular Impaction — Mesial Surface Inaccessible. *A*, radiogram made in standardized position, with greater part of occlusal surface visible and only a small part of root formation; *B*, socket after extraction.

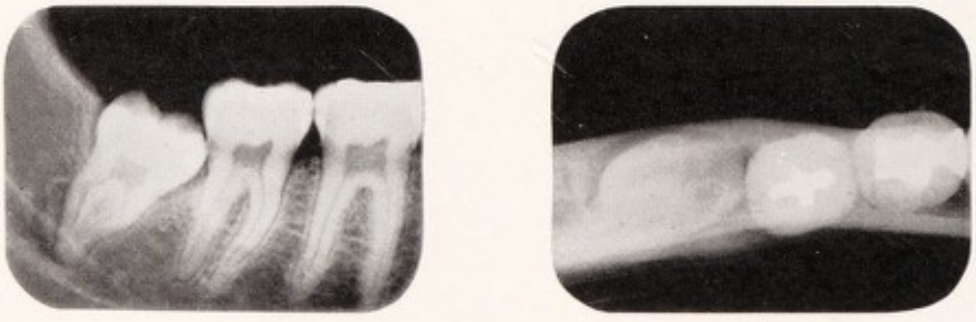
CHAPTER XXI

Operative Technic in Buccoangular Impaction

IN an extremely rare case an impaction will be presented that is the reverse of a lingoangular impaction, where the third molar will be in a buccoangular position compared with the vertical alignment of the second molar. Such an impaction can be distinguished from a lingoangular impaction only by an occlusal radiogram, and, when present, the operative procedure will be more simple where the mesial surface is accessible than in a case of lingoangular impaction on account of a part of the mesial surface of the third molar being deflected buccally out of alignment with the distobuccal surface of the second. When such a case is presented, the technic is similar to that used for a vertical, mesioangular or distoangular impaction where there is a buccal deflection and the mesial surface is accessible (pages 397, 498, 600).

SUMMARY OF CASES

In the case shown in Fig. 784 A the tooth, in addition to being in a buccoangular position, is deflected in a mesioangular position and has the appearance of a lingual deflection. In Fig. 784 B the occlusal radiogram shows the occlusal surface deflected buccally, the roots being directed toward the lingual, and a part of the mesial surface being deflected buccally out of alignment with the distobuccal surface of the second molar. Excision is indicated on the distal surface down to the gingival third, and exolever No. 6L or 6R is applied to that part of the mesial surface which is deflected buccally out of alignment with the distobuccal surface of the second molar. The



A B

Fig. 784. — Buccoangular Impaction — Mesial Surface Accessible. Same case. *A*, lingual radiogram where a part of occlusal surface is visible as in a case of lingual deflection; *B*, occlusal view, showing occlusal surface deflected buccally and roots lingually.

blade is wedged between that part of the mesial surface of the third molar that is not in contact with the distal surface of the second molar and the ossistructure on that surface, sufficient pressure being exerted to fracture the septum between the roots, and direct the tooth distally and upward out of its socket.

In the radiogram shown in Fig. 785 A the case has the appearance of a distoangular impaction where there is no deflection; in Fig. 785 B the occlusal radiogram shows the crown deflected buccally and the roots lingually; and in Fig. 785 C is shown the socket after extraction. The technic for this case is similar to that used for a case of distoangular impaction where there is a buccal deflection and the mesial surface is accessible (page 600).

A

B

C

Fig. 785. — Buccoangular Deflection—Mesial Surface Accessible. Same case, *A*, lingual view, which has appearance of a distoangular impaction where there is no deflection; *B*, occlusal view, showing occlusal surface deflected buccally and roots lingually; *C*, socket after extraction.

BUCCOANGULAR IMPACTION, WITH THE MESIAL SURFACE INACCESSIBLE

A case where the mandibular third molar is impacted in a buccoangular position, with the mesial surface inaccessible, is not commonly seen, and can be determined only by an occlusal radiogram.

CLINICAL EXAMINATION

Exposed Crown.—No part of the crown is exposed.

Gum Tissue.—The gum tissue extends over the entire crown.

RADIOGRAPHIC INTERPRETATION

Crown.—In some cases there is the appearance of a no deflection of the crown and in other cases there appears to be a lingual deflection.

Roots.—Usually no foreshortening of the roots is shown in the radiogram. The root formation that may occur in this class of impaction and its incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root inclined mesially, 2; fused roots, 2, and mesial root inclined distally and distal root straight, 3.

Ossistructure.—The mesial surface is inaccessible on account of being below the superior border of the ossistructure. The structure on the distal surface usually extends up to the occlusal surface, and in some cases over the distoclusal surface. It may extend over the entire occlusal surface, and in some cases over the greater part of the buccal surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—Incision is made to gain access with the ossisector to the mesial, distal, occlusal and buccal surfaces, and to allow the exolever to be applied to the mesial and buccal surfaces. Incision is made as in the case of a mesioangular impaction where the mesial surface is inaccessible and there is no deflection (page 482); in a mesioangular impaction where there is a lingual deflection (page 529), and in a mesioangular impaction where there is a buccal deflection (page 550).

Ossistructure Technic.—Excision on the distal surface is made as in a case of mesioangular impaction (page 483) where the ossistructure extends over the entire distal surface. Excision on the buccal surface is not frequently indicated except in a case where there is no deflection. The excision is made similar to that described for a case of mesioangular impaction where there is no deflection and where the mesial surface is inaccessible (page 484). Where part of the mesial surface is deflected buccally out of alignment with the distobuccal surface of the second molar, the excision to gain access to that part of the mesial surface that is out of alignment buccally with the distobuccal surface of the second molar is made as described for a case of mesioangular impaction where there is a buccal deflection and the mesial surface is inaccessible (page 512). Where the crown of the tooth is deflected quite a distance buccally out of alignment with the distobuccal surface of the second molar, the ossistructure on the buccal surface is usually very thin. When a buccal excision is indicated, extreme care should be exercised on account of the thin buccal plate and the liability of the blade being directed downward between

the gum tissue and the ossistructure. The deflection, however, usually obviates any buccal excision if the excision has been made along that part of the mesial surface that is out of alignment buccally with the distobuccal surface of the second molar in order to apply the blade of the exolever below the mesial surface.

Exolever Technic.—The exolever technic is the same as in the case of a mesioangular impaction where the mesial surface is inaccessible and there is no deflection (page 489). Where part of the mesial surface is deflected buccally out of alignment with the distobuccal surface of the second molar, the technic is similar to that described for a mesioangular impaction where there is a buccal deflection and the

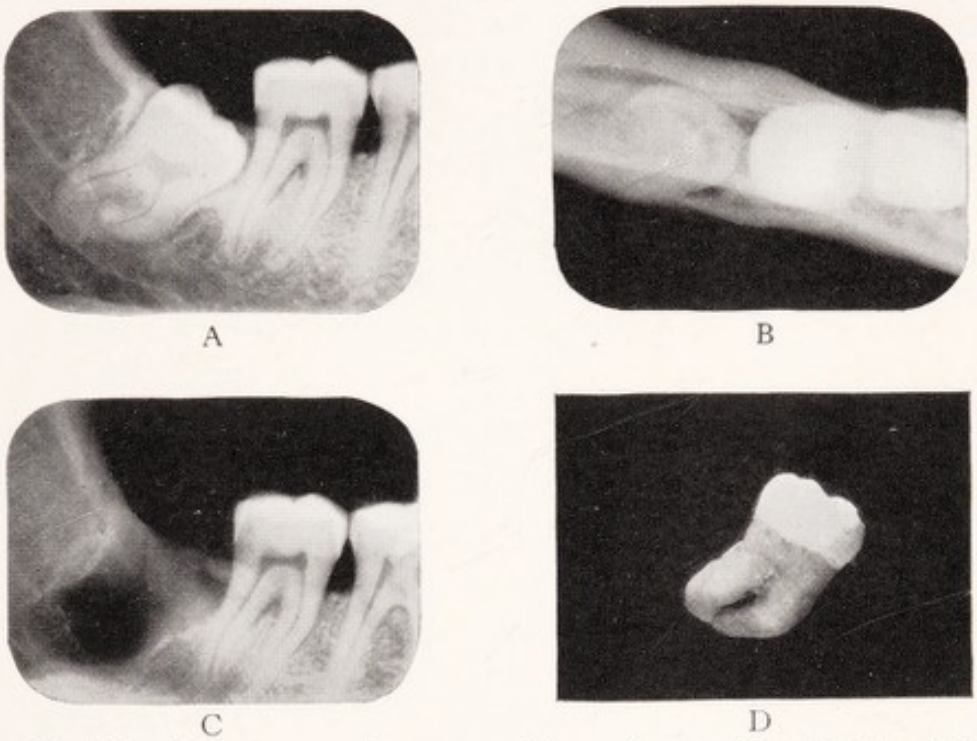


Fig. 786. — Buccoangular Impaction — Mesial Surface Inaccessible. Same case. *A*, lingual view, which has appearance of a mesioangular impaction; *B*, occlusal view, showing occlusal surface deflected buccally and roots lingually; *C*, socket after extraction; *D*, extracted tooth.

mesial surface is inaccessible (page 515). In these cases, the buccal application should not be made until the tooth has been loosened sufficiently to permit the application. Where the position of the mesial surface is similar to a case where the tooth is in a mesioangular position and there is a lingual deflection, the technic is the same as that described for a case of mesioangular impaction where there is a lingual deflection and the mesial surface is inaccessible (page 532).

SUMMARY OF CASES

In the case shown in Fig. 786 A, no definition of a buccoangular impaction can be obtained from the radiogram, as the tooth has the appearance of a mesioangular impaction where there is a slight lingual

deflection. The first and second molars show definite enamel caps and pulp chambers, but no overlap of the contact points of these teeth is visible.

In Fig. 786 B the occlusal view shows the crown deflected buccally and the roots lingually; in Fig. 786 C is shown the socket after extraction, and in Fig. 786 D is shown the extracted tooth. Excision of the ossistructure is indicated on the distal surface in alignment with this surface down to the gingival third. Excision for access to the mesial surface is also made, the exolever being applied to the mesial surface to direct the tooth distally and upward to a distance where a buccal application can be made in order to complete the extraction.

CHAPTER XXII

Operative Technic in Complete Lingual Impaction

THE necessity of determining, in advance of any operative procedure, the exact position of an impacted mandibular third molar was forcibly impressed on the author when the first cases of complete lingual impaction were presented. The uncertainty of the procedure to be followed and the extensive trauma accompanying the effort to extract the tooth, when in such a position, prompted a thorough investigation of this character of impaction. Before the peculiar features of a complete lingual impaction were analyzed, the extraction in such a case was considered the most difficult of any operative procedure connected with an impacted mandibular third molar. After an investigation, however, was made of the character of such an impaction and a definite technic was arranged, the extraction was executed without complications.

COMPLETE LINGUAL IMPACTION, WITH THE MESIAL SURFACE ACCESSIBLE

Where the crown of the third molar is completely deflected to the lingual side of the arch, a type of impaction is presented that is favorable for an exolever technic, but very unfavorable for a forceps technic on account of the almost inaccessible position of the tooth, as it is difficult to gain access to the crown with the beaks of the forceps. Even if the forceps are adjusted, it will be impossible to apply extraction movements with that instrument in conformity with the root formation, while the extraction movements with the exolever are more certain in their execution. The diagnostic points pertaining to a complete lingual deflection should be carefully considered in advance of the operation, so that every successive step in the technic will be definitely executed.

CLINICAL EXAMINATION

Exposed Crown.—Rarely is any part of the crown exposed, but, when there is such an exposure, it is usually a small part of the buccal or buccoclusal surface.

Gum Tissue.—The description above in regard to the exposed crown will apply to the condition of the gum tissue.

RADIOGRAPHIC INTERPRETATION

Crown.—Where the crown is completely deflected toward the lingual side of the arch, as shown in the radiogram with the occlusal surface appearing only in the form of a disk, and with no part of the root formation visible, a second radiogram is made to define the roots. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these teeth is visible. An examination of the mesial surface of the third molar, compared with the distal surface of the second and the superior border of the ossistructure in the first and second radiograms, shows that the mesial surface is accessible to the immediate application of the exolever.

Roots.—In the second radiogram the root formation is clearly defined. As a rule the roots in this type of impaction are not extremely long, but the septum will present resistance that must be overcome in the execution of the exolever technic, which cannot be accomplished with forceps. A fusion of the roots or a mesial root inclined distally and the distal root straight is the prevailing root formation, and on a rare occasion the mesial root in inclined distally and the distal root is inclined mesially.

Ossistructure.—The ossistructure on the distal surface is determined by the first and second radiograms, which will indicate the extent of ossistructure over the occlusal and on the distal surfaces. In the second radiogram the superior border of the ossistructure is observed, which will give an idea of the amount of ossistructure on the buccal surface. The second radiogram will also show the available space between the second and third molars and indicate whether there is any interfering ossistructure between these teeth.

OPERATIVE TECHNIC

Gum Tissue Technic.—Where the buccal surface is exposed, incision is made distally along the buccoclusal surface of the third molar from the distal surface of the second to a distance that will permit excision on the distal surface. Where the gum tissue interferes with the application of the exolever to the mesial surface, incision is then made along the distal surface of the second molar. Where the gum tissue over the occlusal surface interferes with the exolever movements, a slight incision is made on the lingual surface of the second molar downward in alignment with the mesial surface of the third. Where the gum tissue extends over the entire tooth, the incision is made as described on page 768. Where the gum tissue does not extend over the buccal surface, incision is then made distally from the exposed part in line with the buccoclusal surface and downward on the lingual

surface in alignment with the mesial surface of the third molar (Fig. 787). After the incision is made, the tissue over the occlusal surface is displaced with the back of the blade of the ossisector.

Ossistructure Technic.—The ossistructure over the distoclusal and on the distal surfaces is excised with ossisector No. 2L or 3L for the left side or No. 2R or 3R for the right side, the gum tissue over the occlusal and on the buccal surfaces being displaced with the back of the blade. The ossistructure over the distoclusal surface is not very extensive, and, with the ossisector under control, it will not be difficult to execute the necessary excision, which is made toward the occlusal surface. Excision on the distal surface is made as illustrated in Fig. 792, page 771, the operator keeping the excision in line with the distal surface, and excising sufficiently to permit the tooth to be directed up-

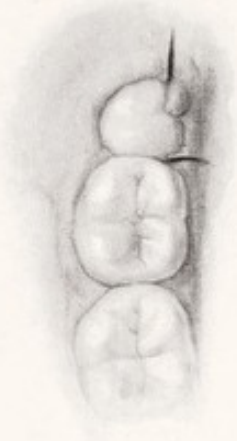


Fig. 787. — Incision of Gum Tissue—Complete Lingual Impaction—Mesial Surface Accessible. Incision distally from exposed part in line with buccoclusal surface and downward on lingual surface in alignment with mesial surface.

ward and distally in conformity with the root formation. No excision on the buccal surface is indicated where the radiogram shows that there is no interference with the application of the exolever to the bifurcation, which condition is more clearly shown in the second radiogram.

Where a pathologic condition involves the ossistructure on the mesial, distal and buccal surfaces, excision is indicated on the buccal surface distal to the bifurcation in order to obtain a secure fulcrum. The ossistructure is, as a rule, very thin on the buccal surface, and, where there is not sufficient ossistructure available as a fulcrum, excision is made on this surface with ossisector No. 11L for the left side or No. 11R for the right side to a point where a secure fulcrum can be obtained. The blade, held in a vertical position, is directed toward the buccal surface of the third molar, which is in a horizontal position, and is more accessible than where this surface is in a vertical position.

The excision should be only sufficient for the exolever to reach the bifurcation and to secure a fulcrum, as illustrated in Fig. 793, page 772. The mesial surface is accessible, and no excision at this point is indicated.

Exolever Technic—Mesial Application.—The third molar is in a horizontal position, with the occlusal surface deflected lingually. Exolever No. 7L for the left side or No. 7R for the right side is selected, and the gum tissue on the buccal surface is displaced with the back of the blade, when the exolever, being held practically in a vertical position, is inserted between the second and third molars. The handle of the exolever is turned mesially to direct the tooth upward and distally, in conformity with the root formation, to overcome the resistance of the septum between the roots (Fig. 795, page 773). Repeated applications of the exolever movement are made if resistance is encountered, the blade being sent each time farther down on the mesial surface to complete the extraction.

Buccal Application.—In the majority of cases the tooth can be extracted by the application of the exolever to the mesial surface, and this procedure is followed except where both roots are straight, in which instance the tooth is loosened first by the adjustment of the exolever to the mesial surface. When the tooth has been loosened, a buccal application of the exolever is made with exolever No. 10L or 10R, the instrument being kept in alignment with the buccal surface, which is in a horizontal position. The bifurcation is located, into which the point of the blade is inserted, and the superior border of the ossistructure along the buccal surface is used as a fulcrum, when the tooth is directed lingually, with pressure under control, to complete the extraction (Fig. 796, page 773).

SUMMARY OF CASES

In Fig. 788 are shown radiograms of the same case of complete lingual impaction where the mesial surface is accessible. In Fig. 788 A the entire occlusal surface is visible; in Fig. 788 B the root formation is detailed; Fig. 788 C is an occlusal view, showing position of crown and roots, and in Fig. 788 D is shown the socket after extraction. The position of the tooth in Fig. 788 B has the appearance of a vertical impaction deflected lingually, whereas it is a complete lingual impaction. Excision is made of the ossistructure on the distal surface, but no excision is indicated on the buccal surface, and the tooth is directed distally, by the application of the exolever to the mesial surface, to overcome the resistance of the root formation, when the extraction is completed by a buccal application.

COMPLETE LINGUAL IMPACTION, WITH THE MESIAL SURFACE INACCESSIBLE

On an extremely rare occasion a case will be seen where there is a complete lingual impaction and the mesial surface is inaccessible to the application of the exolever.

CLINICAL EXAMINATION

Exposed Crown.—Rarely is any part of the crown exposed, and, as a rule, no definition as to the position of the crown can be obtained by a clinical examination.

Gum Tissue.—The entire crown is usually covered by gum tissue.

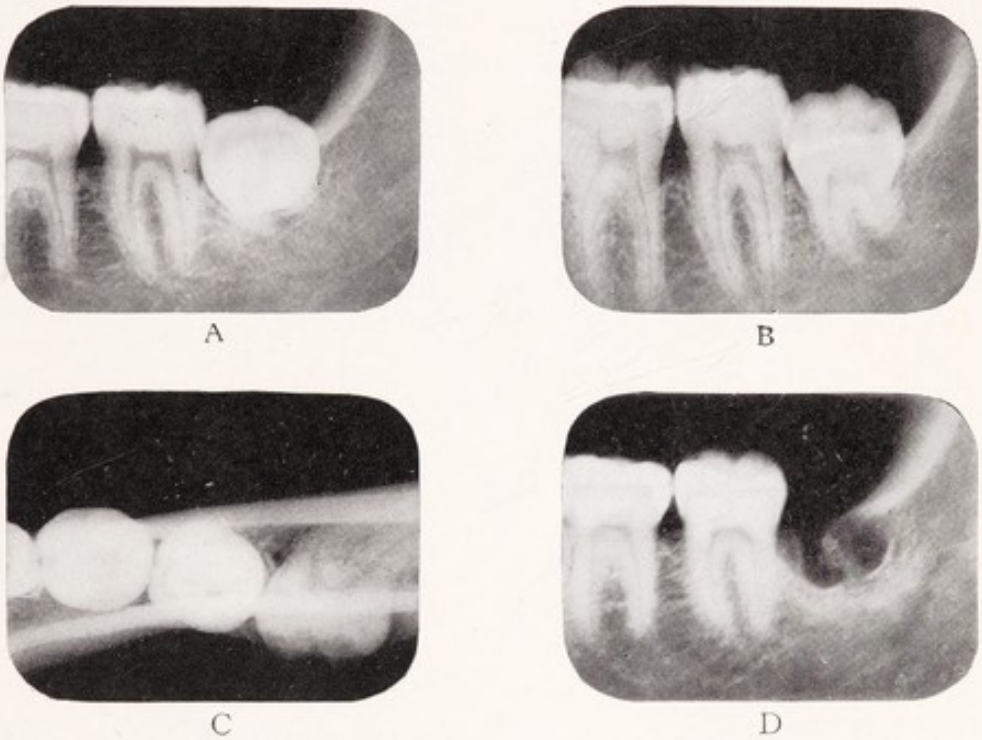


Fig. 788. — Complete Lingual Impaction—Mesial Surface Accessible. Same case. *A*, radiogram made in standardized position, with occlusal surface visible; *B*, second radiogram made to detail root formation; *C*, occlusal view; *D*, socket after extraction.

RADIOGRAPHIC INTERPRETATION

Crown.—The occlusal surface is shown in the form of a disk, but no definition is given of the root formation, and a second radiogram is made to determine this formation. The first and second molars show definite enamel caps and pulp chambers, but no part of the occlusal surfaces of these teeth is visible.

Roots.—As indicated above, a second radiogram is made to define the root formation, as the first radiogram gives only a partial definition of the condition, or perhaps none at all. An occlusal radiogram will show the position of the tooth and at the same time give a definition of the root formation. The root formations that may occur in

this class of impaction and their incidence in 1,000 cases of all types of impaction of the mandibular third molar will be about as follows: mesial root inclined distally and distal root straight, 2; both roots fused, 2, and partially developed roots, 3.

Ossistructure.—The mesial, distal, lingual and buccal surfaces are entirely covered by ossistructure, and the mesial surface is inaccessible to the application of the exolever. Careful consideration should be given to any ossistructure that may be over the occlusal surface, as this structure, when present, is obliterated in the lingual radiogram by the occlusal surface.

In Fig. 789 is shown a complete lingual impaction of the third molar, with a ledge of ossistructure extending over the occlusal surface. The ledge, however, cannot be determined in a lingual radiogram, but can be defined in an occlusal one.

Fig. 789.—Complete Lingual Impaction. Mandible showing ledge of ossistructure over occlusal surface of third molar.

OPERATIVE TECHNIC

Gum Tissue Technic.—An incision is made on the lingual surface of the second molar, slightly anterior to the distal surface, and extends from the gingival margin downward along the entire length of the crown of the third molar. A second incision is made distally from the

distolingual surface of the second molar, and follows the buccoclusal surface of the third molar to a point where the ossistructure on the distal and buccal surfaces can be excised, including any ledge that may extend over the occlusal surface. A third incision is made on the entire distal surface of the second molar (Fig. 790).

Ossistructure Technic—Occlusal Excision.—The first step is to consider any ledge of ossistructure that may be over the occlusal surface. Such a ledge is not over the surface in every case, but, when present, is a resisting factor and will defeat any attempt to direct the tooth lingually unless it is removed. The ledge cannot be excised by directing the ossisector toward the occlusal surface on account of the difficulty of access, and is fractured away with the blade of the ossisector, the operator bearing in mind that the lingual nerve may be in close proximity to the tooth.

Fig. 790.—Gum Tissue Incision—Complete Lingual Impaction—Mesial Surface Inaccessible. Incision downward on distolingual surface of second molar, distally along buccoclusal surface of third molar and along entire distal surface of second molar.

Access to the occlusal surface is obtained readily with ossisector No. 2L or 11L for the left side or No. 2R or 11R for the right side. The blade is directed toward the occlusal surface and the gum tissue is displaced with the back of the blade (Fig. 791 A), which will at the same time thrust aside the lingual nerve if it is in close proximity. The ledge of ossistructure is fractured away by inserting the blade of the ossisector between the ledge and the occlusal surface (Fig. 791 B).

Distal Excision.—An excision of the ossistructure on the distal surface of the third molar is made with ossisector No. 2L, 2R; No. 3L, 3R; or No. 5L, 5R, and, as this surface is in an entirely different position compared with the other types of impaction, access for excision, as a rule, is not difficult. Excision on the distal surface, however, should be sufficient to permit the tooth to be directed upward and distally to a point where the resistance of the septum between the roots will be overcome. If this excision is not executed to the extent indi-

cated and an attempt is made to apply the exolever to the buccal surface for the purpose of directing the tooth lingually, the resisting septum will interfere with the procedure. The gum tissue over the buccal and distal surfaces is displaced with the back of the blade of the ossisector, which is then directed toward the distal surface, starting at the superior border of the ossistructure, and an excision made along the entire distal surface. Where the external oblique ridge extends to the distal surface, excision is started with ossisector No. 5L or 5R.

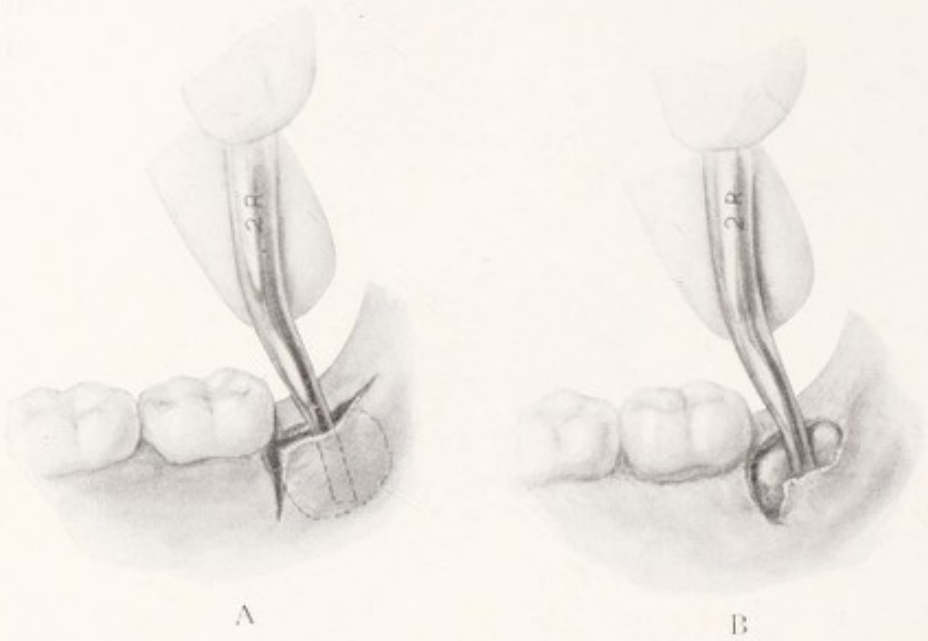


Fig. 791. — Occlusal Excision of Ossistructure—Complete Lingual Impaction—Mesial Surface Inaccessible. *A*, displacing gum tissue over occlusal surface; *B*, blade of ossisector No. 2R inserted between ledge of ossistructure and occlusal surface.

In Fig. 792 A is shown ossisector No. 5R applied to penetrate initially the ossistructure where it is very dense over the distal surface; in Fig. 792 B is shown the distal excision continued with ossisector No. 2R, and Fig. 792 C shows the excision continued with ossisector No. 3R.

Buccal Excision.—An excision is then made on the entire buccal surface, which is in a horizontal position. Ossisector No. 8L or 11L for the left side or No. 8R or 11R for the right side is selected, and the gum tissue on the buccal surface is displaced with the back of the blade. The ossisector, held practically in a vertical position (Fig. 793) is directed toward the buccal surface, its course being governed by the access available. The excision is started at the occlusal surface and is extended along the entire buccal surface to the bifurcation, sufficient ossistructure being left at this point to serve as a fulcrum, when the tooth is directed lingually to complete the extraction.

Mesial Excision.—After the excision of the ossistructure on the buccal surface, the operator should be able, with the blade of the ossisector at the mesial surface, to determine whether access can be obtained without excision, which access is often available. If, however, such access is not available, excision is made on the mesial surface, and this, as a rule, is not difficult, care being taken not to come in contact with the distal surface of the distal root of the second molar.

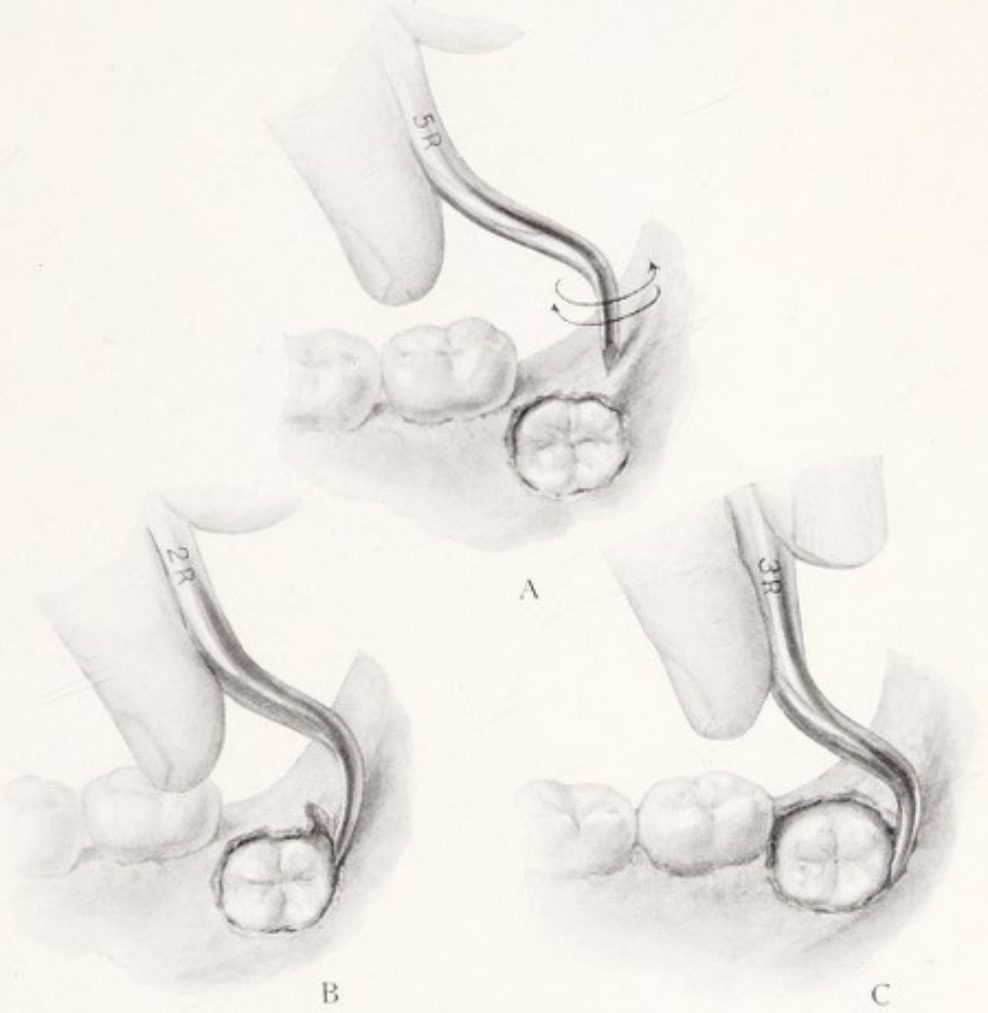


Fig. 792. — Distal Excision of Ossistructure—Complete Lingual Impaction—Mesial Surface Inaccessible. *A*, ossisector No. 5R applied to penetrate initially the ossistructure on the distal surface; *B*, ossisector No. 2R applied; *C*, excision continued with ossisector No. 3R.

The excision is made with ossisector No. 11L for the left side or No. 11R for the right side, and should be made in such a manner that the interseptum between the second and third molars will protect the distal surface of the distal root of the second molar and leave enough ossistructure at this point to serve as a fulcrum. The gum tissue over the buccal surface is displaced with the back of the blade of the ossisector, and the instrument is directed, with pressure under control, toward the ossistructure on the mesial surface, excision being started

at the superior border of the ossistructure and extended until sufficient space has been created to permit the small blade of an exolever to be applied (Fig. 794).

Where the roots are partially developed, often part of the mesial surface is free of the distal surface of the second molar, in which instance the excision for access can be made along that part of the mesial surface that is out of alignment buccally with the distobuccal surface of the second molar. The excision of the ossistructure would be similar

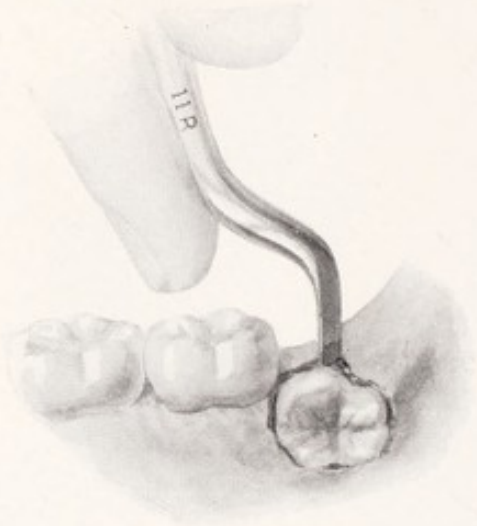


Fig. 793. — Buccal Excision of Ossistructure—Complete Lingual Impaction—Mesial Surface Inaccessible. Ossisector No. 11R applied for excision over buccal surface.

to that made in a case of vertical or mesioangular impaction where there is a buccal deflection when excising for access to that part of the mesial surface that is out of alignment buccally with the distobuccal surface of the second molar (Figs. 438, 539, pages 413, 514).

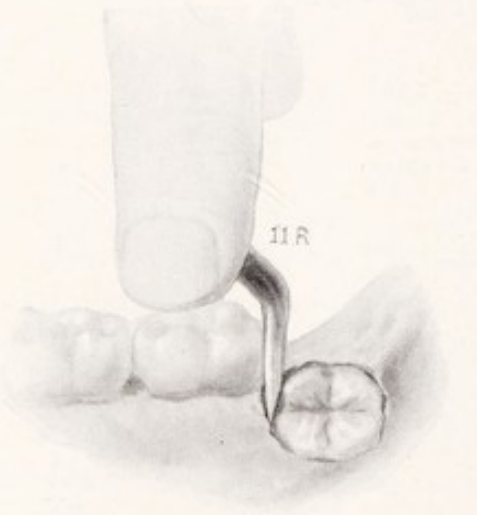


Fig. 794. — Mesial Excision of Ossistructure — Complete Lingual Impaction—Mesial Surface Inaccessible. Ossisector No. 11R applied for excision of ossistructure on mesial surface.

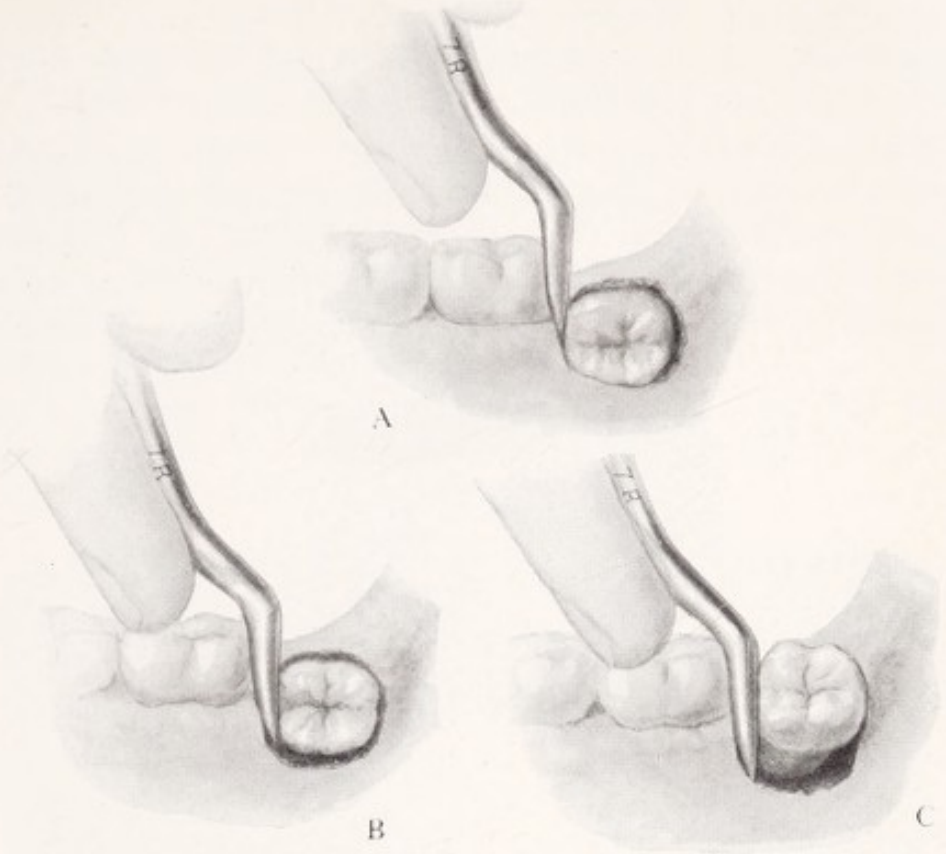


Fig. 795. — Mesial Application of Exolever—Complete Lingual Impaction —Mesial Surface Inaccessible. *A*, exolever No. 7R applied to mesial surface; *B*, blade wedged between mesial surface and ossistructure; *C*, tooth directed upward.

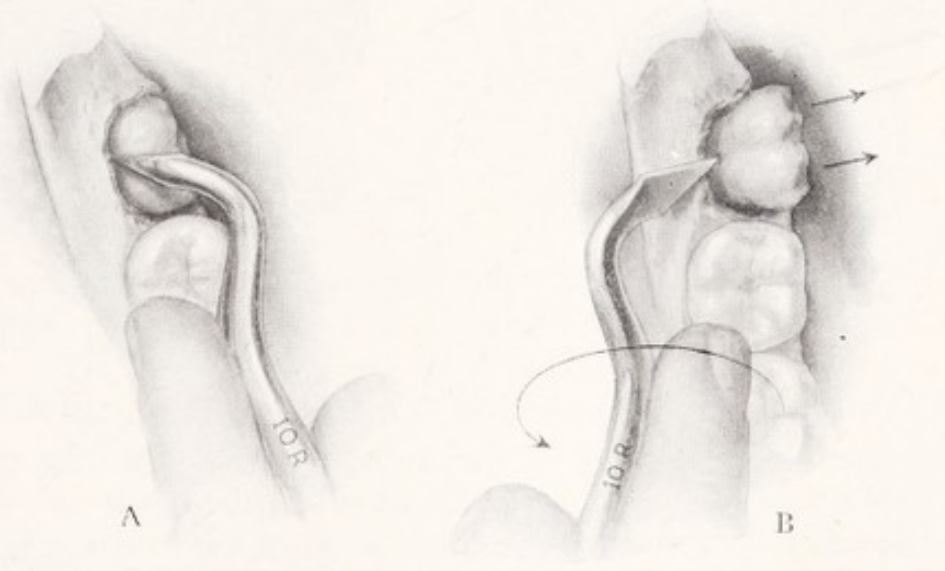
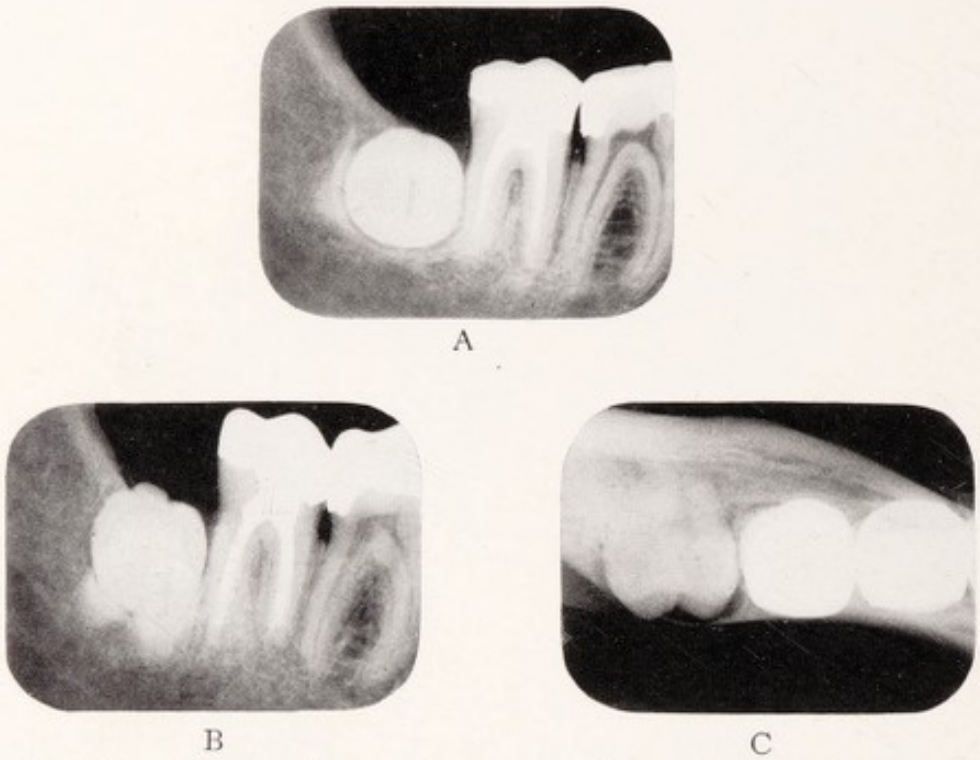


Fig. 796. — Buccal Application of Exolever—Complete Lingual Impaction —Mesial Surface Accessible. *A*, exolever No. 10R applied on buccal surface at bifurcation; *B*, tooth directed lingually by turning handle buccally.

Exolever Technic—Mesial Application.—After the ossistructure over the occlusal surface and on the mesial, distal and buccal surfaces has been excised, and the space between the second and third molars has been determined, exolever No. 2L or 7L for the left side or No. 2R

or 7R for the right side is selected. The gum tissue on the buccal surface is displaced with the back of the blade, and the blade is applied between the third molar and the ossistructure (Fig. 795 A). As the mesial surface is in a horizontal position, a good adjustment of the exolever is usually obtained, and, by directing the blade of the exolever downward (Fig. 795 B), the tooth is directed distally and upward out of its socket in conformity with the root formation, or to a point where the resistance of the septum between the roots is overcome (Fig. 795 C).



A B C

Fig. 797. — Complete Lingual Impaction — Mesial Surface Inaccessible. Same case. *A*, entire occlusal surface visible; *B*, root formation; *C*, occlusal view.

Buccal Application.—When the tooth has been loosened sufficiently but not extracted by the exolever movements applied to the mesial surface, where such a procedure is indicated on account of the character of the root formation, exolever No. 10L for the left side or No. 10R for the right side is selected and the gum tissue on the buccal surface is displaced with the back of the blade, when the blade is adjusted at the bifurcation, the ossistructure being used as a fulcrum (Fig. 796 A). The handle of the exolever is turned buccally, thus directing the tooth lingually out of its socket (Fig. 796 B). The operator should have complete control of the tooth, and not permit it to be directed between the soft tissue and the ossistructure on the lingual. Where the roots are fused or both roots straight, the buccal application is made independently of a mesial, and then extensive excision on the distal surface is not indicated.

SUMMARY OF CASES

In Fig. 797 are shown three radiograms of the same case. Excision is made on the entire distal and buccal surfaces. The occlusal radiogram shows that a small ledge of ossistructure extends over the occlusal surface and excision is indicated at this point. Excision is indicated on the mesial surface to gain access for the application of the exolever, the tooth being directed distally into the space created by the excision on the distal surface, when the extraction is completed by a buccal application.

In the case shown in Fig. 798 A the radiogram has been made in a standardized position and shows the ossistructure extending over the entire tooth; in Fig. 798 B is shown the second radiogram made to

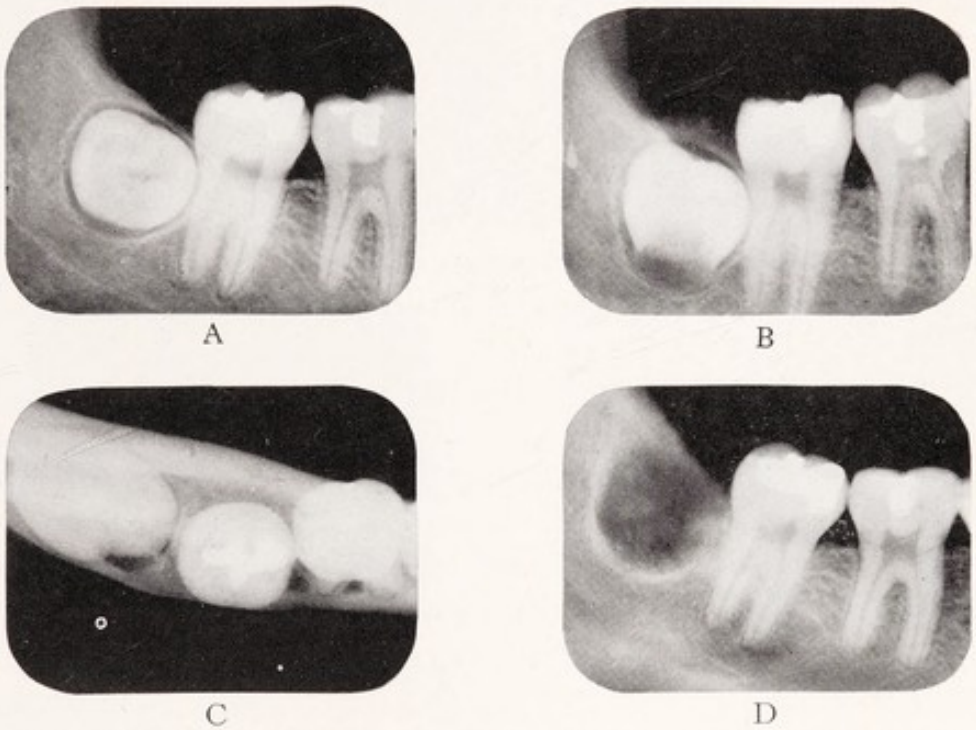


Fig. 798. — Complete Lingual Impaction. Same case. *A*, entire occlusal surface visible; *B*, second radiogram made to detail root formation, which is partially developed; *C*, occlusal view; *D*, socket after extraction.

detail the root formation, which is partially developed; Fig. 798 C is an occlusal radiogram of the case, which shows that part of the mesial surface of the third molar is out of alignment buccally with the distobuccal surface of the second. The operator can take advantage of this condition by excising along that part of the mesial surface that is out of alignment buccally with the distobuccal surface of the second molar, in order to gain access to the mesial surface with the exolever. In Fig. 798 D is shown the socket after extraction. Excision is also indicated on the occlusal, distal and buccal surfaces and the application of the exolever is made to the mesial and buccal surfaces.

CHAPTER XXIII

Operative Technic in Unusual Impaction

AN impacted mandibular third molar in other than a vertical, mesioangular, distoangular, horizontal, linguoangular, buccoangular or complete lingual position would be considered as being in an unusual position, and is seldom seen in practice.

When the operative procedure for the usual cases seen in practice has been mastered, the technic for the unusual cases can be conducted with such modification as may have been suggested by operating on cases of the usual character.

The mandibular third molar, when in an unusual position, will vary considerably in its relation to a normal position, but, as such cases are not of frequent occurrence, specimens of this character are not available in sufficient numbers to present a group of similar cases. Those cases, however, that were obtainable and that contained enough recognizable detail to make good reproductions are described and will be of special interest.

In Fig. 799 are shown two radiograms of the same case, and also the extracted tooth.

In Fig. 799 A is shown an unusual case, where the third molar is in an inverted position, and its contact with the crown of the second molar is the reverse of that usually seen in a horizontal impaction. The distoclusal surface of the third molar is in contact with the second, but the remaining part of the occlusal surface is not in contact with the distal surface of the second molar, and there is quite a space between the mesioclusal surface of the third molar and the distal surface of the second. The prevailing condition where there is a contact in a horizontal impaction is that in which the mesial half of the occlusal surface of the third molar is in contact with the distal or distobuccal surface of the second. The operative technic in such a case is practically the same as in a horizontal impaction, depending on the character of the deflection. In this case there was a slight buccal deflection; excision was made on the distal surface, and access to that part of the mesial surface that was out of alignment buccally with the distobuccal surface of the second was gained by excising the ossistructure along that part of the occlusal surface that was out of alignment buccally with the distobuccal surface of the second molar from the superior border of the ossistructure to the mesial surface.

The exolever technic to be followed is as described for a horizontal

impaction where there is a buccal deflection and the mesial surface is inaccessible (page 662), and there will be no danger of displacing the second molar on account of the contact. The roots are inclined to a slight extent mesially at their apical third, but this condition will not necessarily change the exolever movements, which are upward and distally.

In Fig. 799 B is shown the socket after the extraction of the tooth, and in Fig. 799 C is shown the extracted tooth.

In Fig. 800 A the third molar is not inverted to the extent shown in Fig. 799, although a larger part of the occlusal surface is in con-

A

B

C

Fig. 799. — Inverted Impaction—Mesial Surface Inaccessible. Same case. Two radiograms and a photograph of extracted tooth, where contact is reverse of that usually seen in a horizontal impaction, with distal surface free of ossistructure to gingival third.

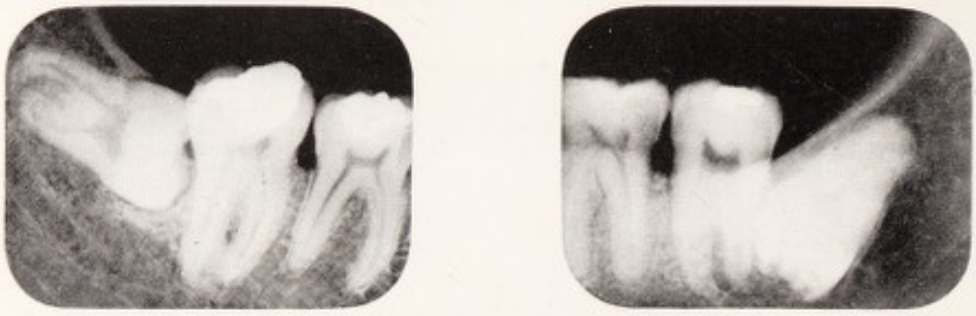
tact with the distobuccal surface of the second molar. The pressure of the third molar has forced the occlusal surface of the second above the corresponding surface of the first molar.

The operative technic in this case indicates extensive excision of the ossistructure on the distal surface of the third molar, which extends slightly beyond the gingival third, on account of the root formation. Access to the mesial surface of the third molar is gained by excising on the buccal surface from the superior border of the ossistructure to a short distance above the mesial surface.

The exolever technic is executed as described for a horizontal impaction where there is a buccolingual deflection, with the mesial surface inaccessible (page 705). When the exolever is adjusted

below the mesial surface to direct the tooth upward and distally, the operator should avoid having the crown of the third molar come in contact with the distobuccal surface of the second, so that the latter tooth may not be endangered.

In Fig. 800 B the third molar is almost completely inverted, with the ossistructure extending over the entire tooth. The contact of the occlusal and distal surfaces of the third molar with the distal root of the second will render the value of the second molar problematical after the extraction of the impacted tooth.



A B

Fig. 800. — Inverted Impaction—Mesial Surface Inaccessible. *A*, contact of crown of third molar with second, the reverse of that usually seen. Occlusal surface of second molar is deflected upward beyond corresponding surface of first molar. Ossistructure extends over entire third molar with exception of small part of distal surface. *B*, contact of crown is at apical third of distal root of second molar, with ossistructure extending over entire tooth.

In Fig. 801 A the third molar is shown in an inverted position similar in some respects to the case shown in Fig. 801 B. The crown is in contact with the distobuccal surface of the distal root of the second molar, and a definite area of pressure absorption of this root has been caused by the impacted tooth, in which case the second molar would not be valuable to the patient after the extraction of the impacted tooth.

In this type of case the operative procedure is to extract the second molar and excise the ossistructure anterior to the occlusal surface and on the distal surface of the third molar, allowing the latter tooth to move gradually in an anterior and upward direction. As the mesial surface and root of the third molar are in close proximity to the mandibular canal, this procedure will avoid endangering the canal, and at a later date the tooth can be extracted with minimum trauma.

In Fig. 801 B the third molar is shown completely inverted, with the occlusal surface located where the apical third of the roots would normally be found, and the apical third of the roots of the third molar extending up to the superior border of the ossistructure, where the crown would normally be found. This is rather an unusual case, as it presents no evidence of a pathologic condition and will require careful judgment on the part of the operator as to the operative procedure to be followed.

The operative technic is the same as in the case of an isolated impacted third molar in a vertical position, with the mesial surface inaccessible (page 458). Excision is first made over the apical ends

Fig. 801. — Inverted Impaction — Mesial Surface Inaccessible. *A*, contact of crown involving apical third of distal root of second molar, with ossistructure extending over entire tooth; *B*, third molar completely inverted, with ossistructure extending over entire tooth.

of the roots, the operator excising the ossistructure between the internal and external oblique ridges and the structure between the bifurcation of the roots, after which he excises extensively on the mesial, distal and buccal surfaces. The exolever technic is the same as described when extracting an isolated vertical impaction, but no dependence can be placed on a buccal application until the tooth has been loosened by a mesial application.

CHAPTER XXIV

Operative Technic in the Extraction of Roots

THE roots of an impacted mandibular third molar that remain in the socket as the result of a fracture at the time of the operation, or that are present from a previous attempt by another operator to extract the tooth, should be extracted, as infection usually develops in the area where roots are allowed to remain. If any roots remain at the time of the operation, they should be extracted before the patient recovers from the anesthetic, whether a general or conduction anesthesia has been administered, as the socket is open and very little trauma will result from the operative procedure. Where, during the operation, it is observed that a part of the roots has remained in the socket, the size of the part, whether it is from a mesial or distal root or from an extra root, whether both remaining roots are separated or intact at the bifurcation, can be determined by an examination of that part of the tooth that has been extracted.

With the position of the tooth and the character of the root formation previously determined by the radiogram, and with the information gained by an examination of the extracted part, the remaining roots can often be extracted without making a second radiogram, provided the operator is able to execute a definite procedure. If, however, the operator has no definite procedure to follow, it will be advisable to discontinue the operation until another radiogram has been made, the position of the roots and their relation to the ossistructure and the second molar have been determined, and a definite technic has been outlined. As is the case in extracting a tooth with the entire crown intact, forceps are contraindicated, and also extensive excision of the ossistructure on the buccal surface, for such procedures are unnecessary. The roots are, as a rule, in the cancellous part of the ossistructure and can be extracted through the open socket after the extraction of the crown.

Excision, when indicated, should be confined to a definite area in conformity with the technic to be employed. Access with forceps is very difficult on account of the inaccessible position of the roots, for this instrument is cumbersome, usually causing considerable trauma while being used. The roots can be extracted with less trauma with an exolever of a design that can be properly adjusted. Accessibility or inaccessibility with an instrument to the mesial surface of the mesial root is determined by the interpretation of the

radiogram in the same manner as is described for determining the accessibility or inaccessibility of the mesial surface of the tooth where the crown is intact (page 87). An examination of the ossistructure mesial, distal and buccal to the roots should be made to determine the extent of excision that may be necessary. In an exceptional case excision is indicated on the buccal surface at or distal to the bifurcation, and in such a case the superior border of the ossistructure should be carefully examined. Where the roots remain as the result of a previous operation and the case is of long standing, it is not unusual to find a pathologic condition of the ossistructure around the roots, which will, as a rule, decrease the resistance during their extraction.

The most common cases where a root remains as the result of a fracture of the crown occur in vertical impaction, as the resistance of the root formation is difficult to overcome in some types of such impaction, and too forcible pressure applied with the exolever usually results in a fracture. A similar incident may occur where both roots are straight and the crown has been directed too far distally, or where no attention has been given to the septum between the roots, and the exolever movements have been improperly applied.

Where the roots remain as the result of a fracture in a mesioangular impaction, the fracture of the crown usually permits ready access to the roots.

Where the roots remain as the result of a fracture in a distoangular impaction, the case is complicated, as in a vertical impaction, by the character of the root formation and its relation to the distal root of the second molar, rendering access more or less difficult.

Cases where the roots remain as the result of a fracture in a horizontal impaction are not of frequent occurrence, as in such cases, where an attempt has been made to extract the tooth, usually a part of the mesial surface remains and is of sufficient strength to support an exolever. Where, however, a root remains, it will not, as a rule, be difficult to extract.

Where the crown has been fractured, and the roots left intact and located below the superior border of the ossistructure, the alignment of the roots compared with the vertical alignment of the second molar should be determined so as to avoid unnecessary excision and improper application of the exolever, as more or less trauma is caused by such a procedure, and the proper method to follow in such a case is to make an occlusal in addition to a lingual radiogram.

Taking the technic of extracting the roots in a vertical impaction as a basis, the extraction of the roots in a mesioangular, distoangular or horizontal impaction will be a modification of the technic where the roots remain in a vertical impaction. In the majority of cases in a

mesioangular or horizontal impaction, the operative procedure is, however, simplified by the position of the roots, as there is no close relationship between the mesial root of the third molar and the distal surface or distal root of the second. In all cases of extracting roots special consideration should be given to the relationship between the mandibular canal and the apical third of the roots.

ROOTS OF A VERTICAL IMPACTION

The roots of a third molar impacted in a vertical position may be differentiated as a single root, roots separated at the bifurcation, roots intact at the bifurcation, both roots fused, and the mesial surface of the mesial root accessible or inaccessible. As a rule the ossistructure, where the roots remain, extends over the entire distal surface of the distal root.

SINGLE ROOT

CLINICAL EXAMINATION

Exposed Surface.—Where a fracture occurs, the condition of the extracted part of the tooth will show whether the root remaining is the mesial or distal root. Where a root remains as the result of a previous operation, a part of the upper surface of the remaining root is occasionally exposed, and a clinical examination may reveal whether it is the mesial or distal root, but no positive definition can be obtained as to the relationship between the root and the ossistructure.

Gum Tissue.—If the socket is open at the time the fracture occurs, the gum tissue will not interfere with the access of an instrument to extract the root. Where a root remains after a previous attempt by another operator to extract it, the gum tissue often partially and sometimes entirely covers the upper surface of the root.

RADIOGRAPHIC INTERPRETATION

Where a radiogram is made of the remaining root, the operator determines whether it is a mesial or a distal root, and its size and direction.

Where the mesial root remains, the operator determines the relation of the mesial surface to the distal surface of the distal root of the second molar, the nature of the interseptum between the mesial root and the distal root of the second molar, and the extent of the ossistructure on the distal surface of the mesial root.

Where the distal root remains, the operator determines its size and direction, the access to the socket and the extent of the ossistructure on the distal surface.

OPERATIVE TECHNIC

Gum Tissue Technic.—Where the socket is open, no incision is usually necessary except where the distal root remains, and excision of the ossistructure on the distal surface is indicated. A slight incision is then made distally from the center of the mesial surface of the distal root to a point that will permit the back of the blade of the ossisector to displace the gum tissue over the distal surface.

Where a root remains as the result of a previous attempt to extract the tooth, incision is made to conform to the application of the ossisector and exolever. Where the mesial root remains, incision is made along the entire distal surface, the operator extending it slightly beyond the buccal surface and mesially from the center of the distal surface to the distal surface of the second molar.

Fig. 802.—Incision of Gum Tissue—Roots of Impacted Third Molar. Incision should be modified for extraction of mesial or distal root.

Where the distal root remains, incision is made along the entire mesial surface, and is extended slightly beyond the buccal surface, and a slight incision is made as described above where excision of the ossistructure on the distal surface is indicated. Modifying the incision shown in Fig. 802 permits excision and the exolever technic to be executed without interference or injury to the gum tissue.

Ossistructure Technic.—Where a single root remains as the result of a previous fracture, one can determine from the radiogram whether the root remaining is the mesial or distal. The ossistructure is interpreted, as bone regeneration often fills that part of the socket from which one of the roots has been extracted, and excision mesial or distal to the remaining root is often indicated to provide access for the exolever and to overcome resistance.

Where the mesial root remains and the ossistructure extends over the entire distal surface, especially in a case where the patient is of advanced age, the ossistructure is excised on the distal surface with

ossisector No. 1L or 2L for the left side or No. 1R or 2R for the right side. Excision is made toward that part of the root to which the exolever is to be adjusted, the operator excising in the same manner as in the case of distal excision where the crown is in a vertical position (page 342). Where the ossistructure is not very dense, or the case is not of long standing, the blade of the exolever may be used to excise the ossistructure to make an adjustment of this instrument to the distal surface of the mesial root.

Where the distal root remains and the ossistructure extends entirely over the mesial and distal surfaces, a condition which will interfere with the adjustment of the exolever to the mesial surface, excision is made along the mesial surface with an ossisector or the blade of the exolever to adjust securely the latter instrument. Where the distal

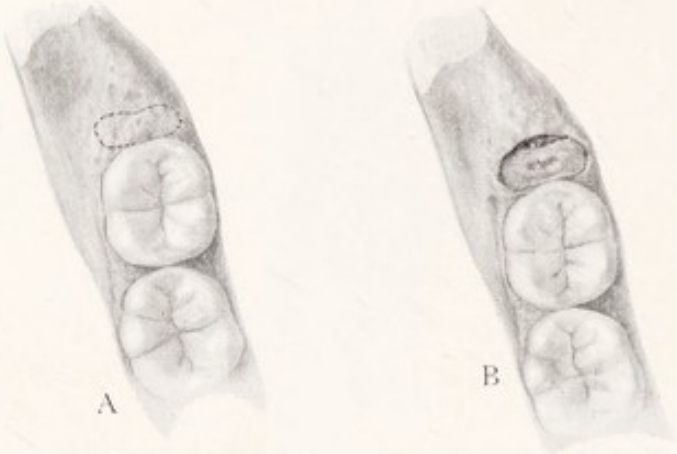


Fig. 803. — Excision over Mesial Root of Impacted Third Molar—Mesial Surface Inaccessible. *A*, ossistructure over entire root; *B*, excision made over root and on distal surface.

root is very long or is inclined distally, an excision is made on the distal surface, and this will decrease resistance at this point so that when the exolever is adjusted to the mesial surface of the distal root the extraction will be more readily executed. There will be occasionally a case where a pathologic condition involves the ossistructure on the distal surface, when no excision will be necessary.

The excision on the mesial surface is made with ossisector No. 7L for the left side or No. 7R for the right side, and the technic is the same as when making an excision on the mesial surface in an isolated case of vertical impaction, where the mesial surface is inaccessible (Fig. 481, page 460). Where the ossistructure extends over the entire root, excision is made over the root, in addition to the excision for the application of the exolever. Ossisector No. 7L or 7R or No. 8L or 8R is indicated.

Where the mesial root remains, and after incision of the gum tissue

has been made, the condition of the ossistructure is as illustrated in Fig. 803 A. The excision is made over the root and a slight excision is made at the center of the distal surface to permit the application of the exolever to the latter surface (Fig. 835 B).

Where the distal root remains and the ossistructure extends over the entire root, excision is started with ossisector No. 5L for the left side or No. 5R for the right side and is continued with ossisector No. 2L or 2R (Fig. 804 A). The excision may be continued over the root with the ossisector used for the distal excision; or ossisector No. 7L or 8L for the left side or No. 7R or 8R for the right side is selected for excision over the root, and also for the excision on the mesial surface (Fig. 804 B).

Exolever Technic.—Where only one root remains at the time of the operation, an examination of the extracted part of the tooth will show

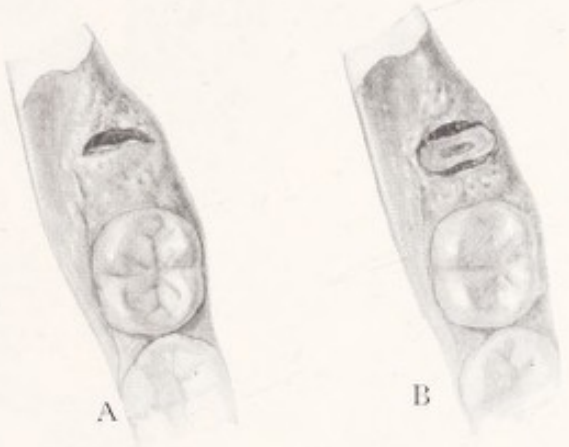


Fig. 804.—Excision on Distal Surface and over Distal Root of Impacted Third Molar. *A*, excision made on distal surface; *B*, excision made on distal surface, over root, and a slight excision for access to mesial surface.

whether it is a mesial or a distal root. The part of the socket left open by the extraction of one of the roots will permit access for the extraction of the remaining root, and exolever No. 11L, 11R; No. 12L, 12R; or No. 13L, 13R is indicated, dependence being placed on whether it is the mesial or distal root and on its size, as the exolevers are designed for application to the mesial or distal surface of the root. The blade of the exolever is shaped so that it will cut through any remaining septum, and the point is sharp enough to penetrate the root. The back of the blade is sufficiently wide to rest upon the ossistructure on the posterior or anterior part of the socket as a fulcrum.

Where the mesial root remains, the exolever is inserted into the open part of the socket, which procedure should be followed instead of trying to adjust the instrument to the mesial surface of the mesial root, as the ossistructure at this point may interfere with the adjustment, and, where possible, the use of the second molar as a fulcrum should

be avoided. The septum distal to the distal surface of the mesial root is usually of a cancellous nature, and is very readily excised. When the blade of the exolever is inserted into the open part of the socket, the gum tissue that may be over the socket is displaced with the back of the instrument, so that the blade can reach the distal surface as closely as possible to the apical third. The handle of the exolever, with the back of the blade resting upon the posterior part of the socket as a fulcrum, is turned distally, and this will cause the blade to cut through

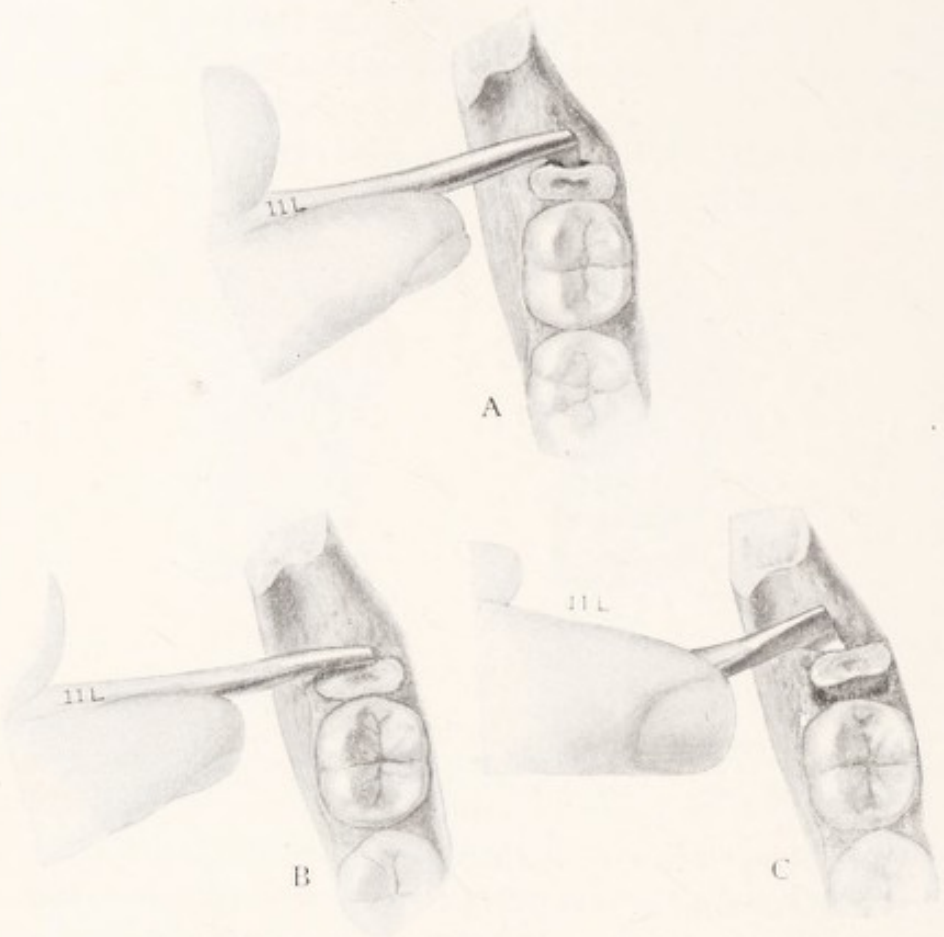


Fig. 805. — Distal Application of Exolever — Mesial Root of Impacted Third Molar. *A*, exolever No. 11R applied at point of excision on distal surface; *B*, blade wedged between distal surface and ossistructure; *C*, tooth directed out of socket.

the septum, when indicated, and engage the distal surface of the mesial root with the sharp point, when the root is readily extracted in line with its long axis.

Where the distal root remains, the reverse of the procedure described above is applied, with the use of the countermate of the exolever for a mesial application to the distal root, and the blade of the exolever is inserted into the open part of the socket to a point where a secure adjustment is obtained on the mesial surface of the distal root. The handle of the exolever is turned mesially, and this will cause the

blade to cut through the septum, the back of the blade resting upon the anterior part of the socket as a fulcrum.

Where the mesial or distal root remains and the ossistructure has been excised over the root, the ossistructure distal to the distal surface of the mesial root and mesial to the mesial surface of the distal root is used as a fulcrum.

Where the mesial root remains, no excision is indicated on the mesial surface, and after the necessary excision has been made to provide access for the exolever blade, the point is inserted at the center

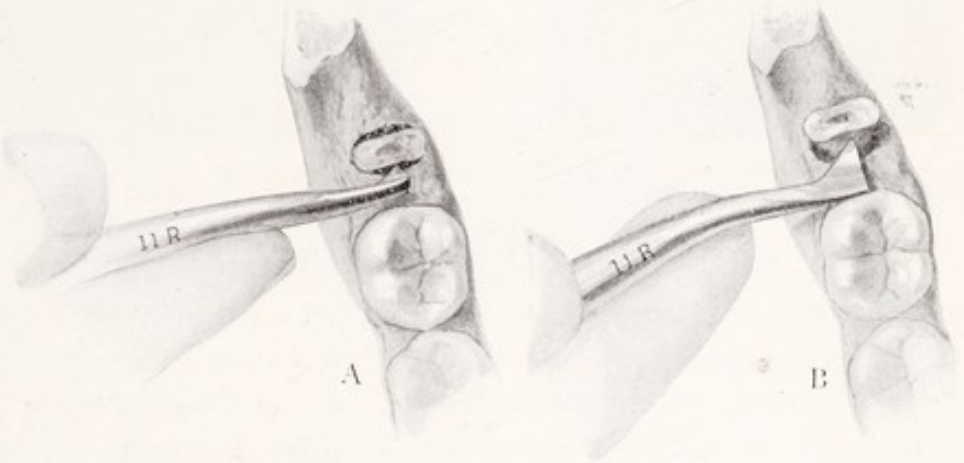


Fig. 806. — Mesial Application of Exolever — Distal Root of Impacted Third Molar. *A*, exolever No. 11R being applied to mesial surface of distal root; *B*, root directed out of socket by turning handle mesially.

of the distal surface (Fig. 805 A), the blade is wedged between the mesial surface and the ossistructure (Fig. 805 B), and the handle is then turned distally to direct the root out of its socket (Fig. 805 C).

Where the distal root remains, and the ossistructure has been excised over the root and on the mesial and distal surfaces, the exolever blade is applied to the mesial surface (Fig. 806 A), the blade being wedged between the ossistructure and the mesial surface, and the handle turned mesially to direct the tooth out of its socket (Fig. 806 B).

SUMMARY OF CASES

In the cases shown in Fig. 807, where the mesial root remains and the ossistructure has regenerated over the entire root, excision is indicated over the root and on the distal surface to a point where the blade of the exolever can be adjusted to this surface, the ossistructure distal to the part excised being utilized as a fulcrum.

ROOTS SEPARATED AT THE BIFURCATION

Where both roots remain as the result of a fracture at the time of the operation, no positive definition as to the character of the bifurcation can be obtained unless a radiogram is made. Where it is shown

by the radiogram that both roots remain after a previous attempt at extraction and that they are separated at the bifurcation, the operative technic is the same as in the case of extraction of the roots of the mandibular first molar.* The radiogram is studied to determine the length of the roots remaining and the extent of their separation at the bifurcation.

Fig. 807.—Root of Vertical Impaction. Mesial root remaining, with ossistructure extending entirely over it.

CLINICAL EXAMINATION

Exposed Roots.—In an occasional case, where both roots are separated at the bifurcation as the result of a previous attempt at extraction, the character of the separation can be determined by a clinical examination after the gum tissue over the roots has been displaced.

Gum Tissue.—Where the case is of long standing, the gum tissue usually extends over the roots, or they are slightly exposed, in which latter case their position is readily determined.

OPERATIVE TECHNIC

Gum Tissue Technic.—Incision is not necessary where the roots remain at the time of the operation. Where, however, the roots remain as the result of a previous operation, the radiogram will give a definition of the bifurcation, and in some cases no incision will be indicated if the roots are partially exposed. Where the gum tissue extends over the roots, an incision is made along the buccal surface, which is usually sufficient if the tissue is not very dense. Where, however, the gum tissue extends over the roots, an additional incision is made at the center of the bifurcation, from the buccal toward the lingual surface, which incision will make a good flap and at the same time prevent the tissue from being injured.

Ossistructure Technic.—Rarely in this type of case is excision of the ossistructure indicated.

Exolever Technic.—Exolever No. 11L, 11R; No. 12L, 12R; or No. 13L, 13R is indicated for the extraction, respectively, of the mesial and distal roots. As a rule, it is better to extract first the mesial root, as it is usually more accessible.

**Exodontia,* 1913, page 240.

The exolever to be applied to the distal surface of the mesial root is selected, and the point of the blade is directed toward the center of the two roots, the blade being inserted midway between the buccal and lingual surfaces, and sufficient pressure applied to create a wedge, which will usually dislodge one or both roots. If the wedge does not have this effect, the blade is sent farther between the roots to a point where a secure adjustment is obtained on the mesial surface of the mesial root. The handle of the exolever, with the back of the blade resting upon the mesial surface of the distal root as a fulcrum, is turned distally to extract the root.

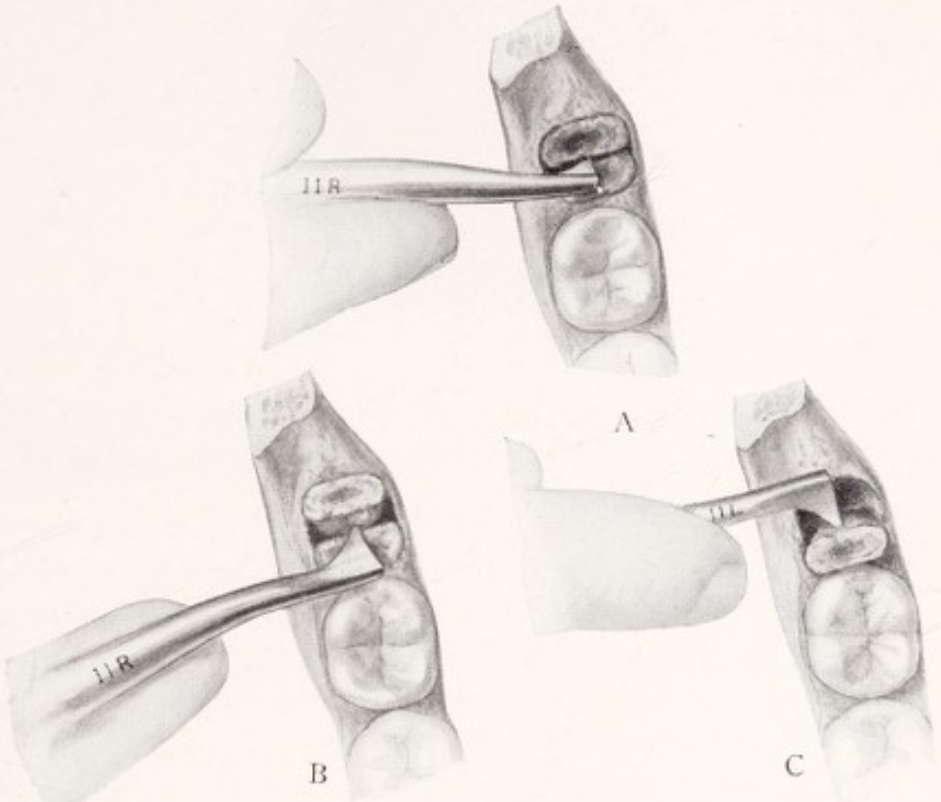


Fig. 808. — Application of Exolever to Mesial and Distal Roots of Impacted Mandibular Third Molar. *A*, exolever No. 11R applied between roots; *B*, distal root directed upward and distally; *C*, blade directed into socket created by extraction of distal root along distal surface of mesial root.

When the mesial root has been extracted, the countermate of the exolever used is selected, and the point of the blade is inserted into that part of the socket created by the extraction of the mesial root, directed to a point where an adjustment can be obtained on the mesial surface of the distal root. If there is any interfering septum, the pressure applied when turning the handle of the exolever mesially should be sufficient to cut through the septum. The point of the blade engages the distal root, and with the back of the blade resting upon the anterior part of the socket, the handle of the exolever is turned mesially, which procedure will extract the distal root.

The procedure described above for extracting the mesial and distal roots may be reversed by extracting first the distal root, the order of extraction depending on the size and strength of the roots and the available space between them (Fig. 808).

SUMMARY OF CASES

In the case shown in Fig. 809 the roots are separated at the bifurcation, and no excision of the ossistructure is indicated. The blade of the exolever is adjusted to the mesial or distal root and the technic described above is executed.

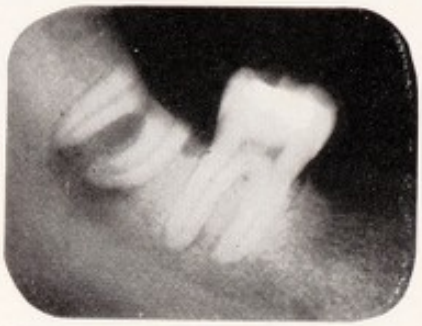


Fig. 809.—Roots of Mandibular Third Molar. Roots remaining and separated at bifurcation.

ROOTS INTACT AT THE BIFURCATION, WITH THE MESIAL SURFACE OF THE MESIAL ROOT ACCESSIBLE

CLINICAL EXAMINATION

Exposed Roots.—Where the roots remain at the time of the operation, an examination of the extracted part of the crown may give some idea as to the condition of the remaining part, but it will be difficult to determine the relationship between the bifurcation and the superior border of the ossistructure along the buccal surface.

Where the case is the result of a previous attempt at extraction, it is not practicable to determine from the parts exposed the diagnostic points essential in the execution of the operative procedure without undue trauma and guesswork.

Gum Tissue.—Where the case is the result of a previous attempt at extraction and is of long standing, the gum tissue usually extends over the roots and rarely is any part exposed.

RADIOGRAPHIC INTERPRETATION

Where both roots remain and are not separated at the bifurcation, with the mesial surface of the mesial root accessible, this surface is observed in the radiogram to determine its relation to the distal root of the second molar, the extent to which the latter surface is free of ossistructure, and the size of the interseptum between the mesial surface of the root of the third molar and the distal surface of the

distal root of the second. The operator determines the extent to which the ossistructure extends over the distal surface of the distal root, the amount and condition of the ossistructure remaining above the bifurcation on the buccal surface, the character of the root formation, and the crown structure above the bifurcation.

OPERATIVE TECHNIC

Gum Tissue Technic.—Where the roots remain as the result of a previous extraction, incision of the gum tissue is made along the buccal surface of the roots to permit excision of the ossistructure on the distal surface of the distal root and to allow a mesial or buccal application of the exolever. Where the gum tissue on the mesial surface is liable to be subject to trauma, a slight incision is made on the buccal surface downward slightly anterior to the mesial surface to allow the application of the exolever at this point. Where the gum tissue extends entirely over the roots, a slight incision along the distal surface of the second molar from the distobuccal toward the distolingual surface will often prevent the tissue from being injured at this point. The incision is similar to that described where the crown is in a vertical position (Figs. 369, 413, pages 341, 388).

Ossistructure Technic.—Where the roots are very long and the bifurcation is below the superior border of the ossistructure, they can often be extracted without being separated by applying the exolever to the mesial surface and completing the extraction by a buccal application. This procedure, however, cannot be followed unless an excision of the ossistructure is made on the distal surface of the distal root to create a space to permit the roots to be directed distally and at the same time overcome the resistance of the roots and septum between them.

No excision is indicated on the mesial surface where it is accessible to the application of the exolever without interference from the superior border of the ossistructure, and no excision is indicated on the buccal surface where the bifurcation is not too far from the superior border.

Distal Excision.—Excision on the distal surface of the distal root is made with ossisector No. 1L or 3L for left side or No. 1R or 3R for the right side. The gum tissue over the distal root is displaced with the back of the blade, and the blade is directed distally toward the ossistructure to be excised, when, with pressure under control, excision is made toward the distal surface of the distal root until sufficient space has been created into which the roots may be directed. The excision is made as described for a distal excision where the crown is in a vertical position (page 342).

Exolever Technic—Mesial Application.—If, after the necessary excision has been made on the distal surface of the distal root, the exolever can be applied to the mesial surface, and the buccal and lingual surfaces of the roots of the third molar are in alignment with the corresponding surfaces of the roots of the second molar, exolever No. 1L for the left side or No. 1R for the right side, which has a small blade, is adjusted to the mesial surface. When the adjustment has been made, the handle of the exolever is turned mesially to direct the roots distally and upward to a point where the bifurcation will be above the superior border of the ossistructure, and a buccal application is made to complete the extraction. Repeated applications are often necessary, the blade being sent each time farther downward on the mesial surface to improve the fulcrum, which in this case is the superior border of the ossistructure. The use of the second molar as a fulcrum should be avoided. The exolever technic is executed as described for a mesial application where the crown is in a vertical position (Fig. 381, page 360).

Where an occlusal radiogram shows that a part of the mesial surface of the mesial root of the third molar is deflected buccally out of alignment with the distobuccal surface of the distal root of the second molar, or if this condition is revealed after the incision of the gum tissue where no occlusal radiogram has been made, the operator takes advantage of that part of the mesial surface that is deflected out of alignment buccally to apply exolever No. 6L for the left side or No. 6R for the right side. The adjustment of the blade is made on that part of the mesial surface that is free of the buccal surface of the distal root of the second molar, and the exolever technic is executed in conformity with the root formation as in the case where the entire crown is intact and the tooth is deflected buccally (page 400).

Where both roots are inclined distally, no great amount of resistance will be encountered; but, if considerable resistance is presented, a degree of pressure should be exerted as in the case where the mesial root is inclined distally and the distal root is straight (page 358). Where the mesial root is inclined distally and the distal root is inclined mesially, with a septum between them, considerable resistance will be encountered when the roots are directed distally to fracture the septum, and increased pressure is indicated. Where both roots are straight or divergent, the decision to separate the roots at the bifurcation or to make mesial and buccal applications is governed largely by the size of the remaining roots. Where there is quite a space between the mesial surface of the mesial root of the third molar and the distal surface of the distal root of the second, exolever No. 11L or 12L for the left side or No. 11R or 12R for the right side is applied to the center

of the mesial surface, following the procedure indicated in a case of extracting the roots of a third molar where the mesial surface is inaccessible (Fig. 816, page 801).

Buccal Application.—Where both roots are straight and short, with the bifurcation accessible, and where the superior border of the ossistructure on the buccal surface does not interfere with a buccal application, such application can often be made without excising the ossistructure on the distal surface of the distal root. Where, however, the root formation will not permit such a procedure, the buccal application of the exolever is made after the roots have been directed distally and upward to a point that will allow such an application. Exolever No. 10L for the left side or No. 10R for the right side is indicated, and the blade is applied at the bifurcation, a wedge being created between the bifurcation and the superior border of the ossistructure on the buccal surface, which will have the effect of extracting the roots. If resistance is encountered, the handle of the exolever is pressed downward and turned to a slight extent buccally, with the back of the blade resting upon the superior border of the ossistructure as a fulcrum. The exolever technic is executed as described for a buccal application where the crown is in a vertical position (page 361).

Mesiobuccal Application.—Where the roots are in contact no attempt should be made to adjust the exolever to the mesial surface to direct the tooth distally with exolever No. 1L or 1R. In this type of a case the adjustment of the exolever is made to the mesiobuccal surface, exolever No. 9L or 9R being indicated, and the technic is executed as described for a mesiobuccal application where the crown is in a vertical position (Fig. 388, page 371).

Fig. 810.—Roots of Vertical Impaction—Mesial Surface of Mesial Root Accessible. Mesial root inclined distally and distal root straight, roots being intact at their bifurcation. There is a contact of mesial root of third molar with distal root of second. The ossistructure extends over entire distal surface and greater part of lingual and buccal surfaces.

SUMMARY OF CASES

In Fig. 810 are shown two cases where both roots remain and are intact at the bifurcation. The mesial root is inclined distally and the distal root is straight, with a part of the mesial surface of the mesial

root accessible, the latter root being in contact with the distal root of the second molar, and the ossistructure extending over the entire distal surface of the distal root.

Excision of the ossistructure on the distal surface of the distal root is indicated, but sufficient space is available on the mesiobuccal surface for the application of exolever No. 9L or 9R, so that no excision is indicated at this point. The handle of the exolever is directed downward, and the roots which remain intact are directed distally with an upward movement, thus raising them to a point where the bifurcation will be even with the superior border of the ossistructure and allowing a buccal application of the exolever to be made to complete the extraction.

In Fig. 811 are shown two cases where the mesial root is inclined distally and the distal root is straight. Excision is made on the distal surface of the distal root, and, as there is quite a space between the mesial surface of the mesial root of the third molar and the distal surface of the distal root of the second, the ossistructure along the mesial root is utilized as a fulcrum. Exolever No. 11L for the left side or No. 11R for the right side is adjusted to the center of the mesial surface, and, excision of any ossistructure that may interfere with the adjustment is made with the blade of the exolever. The roots are directed distally to a point where the resistance of the distal inclination of the mesial root will be overcome. Care should be taken, however, not to direct the roots so far distally as to cause a fracture of the straight distal root. The extraction is completed by a buccal application.

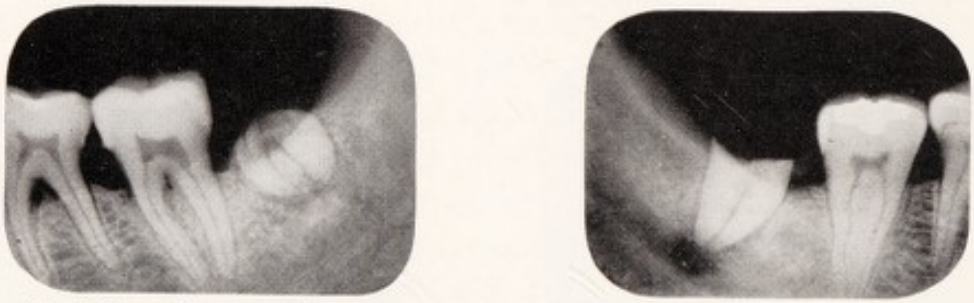


Fig. 811. — Roots of Vertical Impaction—Mesial Surface of Mesial Root Accessible. Mesial root inclined distally and distal root straight, with ossistructure extending over entire distal surface and greater part of lingual and buccal surfaces.

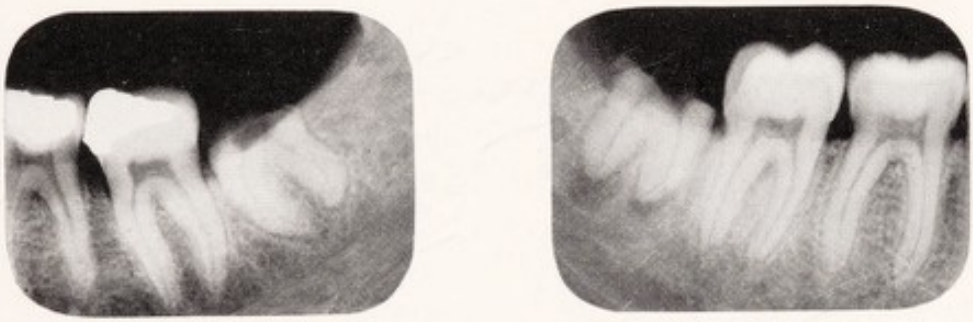
In Fig. 812 A is shown a case where the mesial root is inclined distally and the distal root is inclined mesially, with a large septum between them, and excision of the ossistructure on the distal surface of the distal root is indicated. The mesial surface is accessible to the application of a small blade of an exolever, and the roots are directed distally with considerable pressure to fracture the septum between them and raise the roots to a point where a buccal

application can be made at the bifurcation to complete the extraction.

In Fig. 812 B is shown a case where both roots are straight and the mesial surface is accessible, with a slight pathologic condition on the distal surface of the distal root. The operator has a choice of two procedures, and the length and strength of the roots will govern the technic.

Where the roots are short and the bifurcation is about in alignment with or above the superior border of the ossistructure, a buccal application at the bifurcation with exolever No. 10L for the left side or No. 10R for the right side is made with sufficient pressure to create a wedge without making a distal excision or mesial application, which will usually extract the roots upward in line with their long axes without fracturing either root.

Where the roots are of considerable length, excision is made on the distal surface of the distal root, and the exolever is adjusted to the mesial surface of the mesial root to loosen it slightly, when a buccal application is made to complete the extraction.



A B

Fig. 812. — Roots of Vertical Impaction—Mesial Surface of Mesial Root Accessible. *A*, mesial root inclined distally and distal root inclined mesially, with ossistructure extending over entire distal surface and greater part of lingual and buccal surfaces; *B*, roots straight.

In the case shown in Fig. 813, a slight excision is indicated on the buccal surface at the bifurcation in order to secure an adjustment of the exolever, and the entire extraction is completed by a buccal application.

Fig. 813. — Roots of Vertical Impaction—Mesial Surface of Mesial Root Accessible. Roots straight. Ossistructure on distal surface involved by pathologic condition, which extends over greater part of lingual and buccal surfaces.

ROOTS INTACT AT THE BIFURCATION, WITH THE MESIAL SURFACE OF THE MESIAL ROOT INACCESSIBLE

CLINICAL EXAMINATION

Exposed Surface.—Where both roots remain as the result of a previous attempt at extraction, no dependence can be placed on the clinical examination by displacing the gum tissue over the roots in order to ascertain the relationship between the ossistructure and the roots or between the location of the bifurcation and the superior border.

Gum Tissue.—The gum tissue usually extends over the roots.

RADIOGRAPHIC INTERPRETATION

Where both roots remain as the result of a previous attempt at extraction and the case is of long standing, the ossistructure is usually involved by a pathologic condition, and the resistance that may be presented will not be so great as in a case where a fracture occurred at the time of the operation, leaving both roots *in situ*, with the mesial surface inaccessible. Where this incident has occurred, it will be inadvisable to attempt to apply the exolever to the mesial surface, as the ossistructure at that point will interfere with the adjustment of the instrument, and, in addition, the resistance of the ossistructure on the distal surface of the distal root will not permit the roots to be directed distally.

Where a fracture of the kind described has occurred, an operator who is not familiar with the technic that is to be followed should make another radiogram to determine the access to the mesial surface of the mesial root, the character of the ossistructure on the distal surface of the distal root, and the relationship between the superior border of the ossistructure and the bifurcation. In case the operator cannot determine the nature of the original deflection of the crown, an occlusal radiogram is made to determine the alignment of the buccal surface of the mesial root of the third molar with the corresponding surface of the distal root of the second, in order that a procedure may be outlined for the excision of the ossistructure and the application of the exolever to the mesial surface.

Where there was no deflection, a study is made of the size of the interseptum between the mesial surface of the mesial root of the third molar and the distal surface of the distal root of the second.

Where there was a buccal deflection, the extent to which part of the mesial surface of the mesial root of the third molar is deflected out of alignment buccally with the distobuccal surface of the distal root of the second is determined.

Where there was a lingual deflection, the available ossistructure that can be used as a fulcrum and the extent to which the roots are inclined lingually are determined.

Where there was a buccolingual deflection, the relationship between the mesial surface of the mesial root of the third molar and the distobuccal surface of the distal root of the second is determined.

In Fig. 818, page 802, are shown lingual and occlusal radiograms of a case where the line of fracture was even with the superior border of the ossistructure. In the occlusal radiogram is shown the relationship between the mesial surface of the mesial root of the third molar and the distal surface of the distal root of the second.

Access in a case of this kind, where both roots remain, is not a simple procedure, and, in order to avoid extensive excision of the buccal plate, which is unnecessary, every detail shown in the radiogram should be carefully interpreted, so that the operation may be executed in accordance with a definite technic and trauma may be reduced to a minimum.

OPERATIVE TECHNIC

Gum Tissue Technic.—In a case where a previous attempt at extraction has been made and the gum tissue extends over the roots, the incision should conform to the excision to be made on the mesial, mesiobuccal, distal and, when indicated, buccal surfaces and to the application of the exolever to be made to these surfaces.

Where the roots of the third molar are in alignment with the distal root of the second, an incision is made on the buccal surface of the third molar roots slightly anterior to the mesial surface of the mesial root. A second incision is made on the buccal surface of the roots from the starting point of the first incision distally far enough to permit excision on the distal surface of the distal root. If the gum tissue extends over the roots, a slight incision along the buccal half of the distal surface of the second molar will prevent injury to the tissue in this region.

Where a part of the mesial surface of the mesial root of the third molar is deflected out of alignment buccally with the buccal surface of the second, an incision is made along that part of the mesial surface of the root that is out of alignment buccally with the distobuccal surface of the second molar, after which an incision is made along the buccal surface. Where there is a buccolingual deflection, the incisions are governed by the relationship between the mesial surface of the mesial root of the third molar and the distobuccal surface of the distal root of the second.

Ossistructure Technic.—Access for excision of the ossistructure in

this type of case where the roots remain is difficult on account of the distance to the point of access, which should be determined in advance of operating, and a certain point for excision should be selected by a careful interpretation of the radiogram. Excision is made on the mesial, mesiobuccal, distal, and, when indicated, buccal surfaces.

Distal Excision.—As the ossistructure extends entirely over the distal surface of the distal root, excision is made on this surface. The excision is made with ossisector No. 1L or 3L for the left side or No. 1R or 3R for the right side, the gum tissue over the roots being displaced with the back of the blade of the ossisector, and the blade is directed slightly distal to the ossistructure to be excised, when excision, with pressure under control, is made toward the distal surface of the distal root until sufficient space has been created at this point into which to direct the roots (Fig. 814).

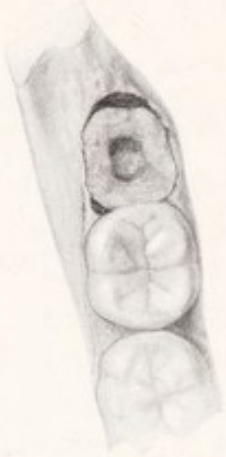


Fig. 814. — Mesiobuccal Excision of Ossistructure—Roots of Vertical Impaction—Mesial Surface of Mesial Root Inaccessible. Excision at mesiobuccal and distal surfaces.

Mesial or Mesiobuccal Excision.—After the necessary excision has been made on the distal surface of the distal root, excision is made to gain access with the exolever to the mesial or mesiobuccal surface of the mesial root, as the superior border of the ossistructure will interfere with an adjustment of the exolever at this point.

Where there is no deflection of the roots, and the buccal surface of the mesial root of the third molar is in alignment with the buccal surface of the distal root of the second, the size of the interseptum between the roots of the second and third molars will give the operator an idea of the point where and to what extent excision is necessary to adjust the exolever to the mesial surface. In the majority of cases there is a large interseptum, but, where there is a small interseptum and a close contact of the two surfaces of the roots, care should be taken not to mar the distal surface of the distal root of the second molar.

The gum tissue in the region of the mesiobuccal surface of the mesial root is displaced with the blade of ossisector No. 8L for the left side or No. 8R for the right side, and the blade is directed toward the mesiobuccal surface, where sufficient excision is made to allow an adjustment of an exolever (Fig. 814, page 798).

Where a part of the mesial surface of the mesial root of the third molar is deflected out of alignment buccally with the distobuccal surface of the distal root of the second, excision is made along that part of the mesial surface that is out of alignment, care being taken that the blade does not come in contact with the distal root of the second molar. The technic is executed as described for a mesial

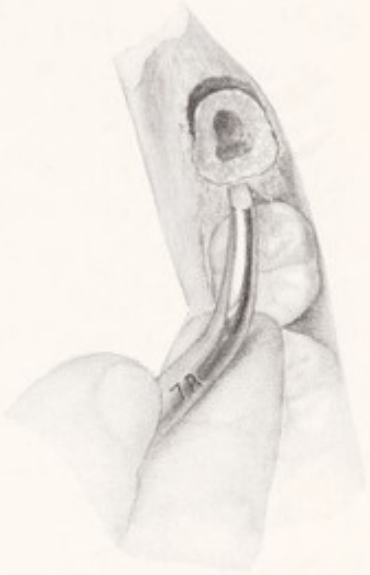


Fig. 815.—Mesial Excision of Ossistructure—Roots of Vertical Impaction—Mesial Surface Inaccessible. Ossisector No. 7R applied for excision at center of mesial surface.

excision where the crown is in a vertical position and deflected buccally, with the mesial surface inaccessible (Fig. 438, page 413).

Where there is a large interseptum between the roots of the second and third molars the adjustment of the exolever can then be made to the center of the mesial surface, and excision for access is made with ossisector No. 7L or 7R along the mesial surface of the mesial root (Fig. 815).

Buccal Excision.—Rarely is the buccal excision indicated, as in the majority of cases, after excision has been made on the mesial and distal surfaces, the roots can be directed distally and upward to a point where the bifurcation will be at or above the superior border of the ossistructure and allow an adjustment of the exolever.

Where the radiogram shows that the root formation and septum between the roots will render the foregoing procedure impracticable, an excision is made for a buccal application of the exolever to the

buccal surface of the roots. The extent of the excision is governed by the distance that the roots, by the application of pressure to the mesial surface, can be directed upward and distally compared with the relation of the bifurcation to the superior border of the ossistructure. Where excision is indicated, it is made with ossisector No. 11L for the left side or No. 11R for the right side, and is made at or slightly distal to the bifurcation, depending on the character of the initial procedure.

Where an immediate adjustment of the exolever is indicated at the bifurcation, such a procedure is followed. Where, however, the roots are first to be directed distally and upward, the excision is made slightly distal to the bifurcation.

The gum tissue over the buccal surface of the roots in the region where the excision is to be made is displaced with the back of the blade of the ossisector, and the blade is directed toward the part to be excised, with the blade resting upon the superior border of the ossistructure. The operator should not make the approach to this point from the extreme buccal surface of the outer border of the mandible, but the adjustment of the blade should be made as closely as possible to the buccal surface of the roots, when excision is made toward the buccal surface to a point where the operator is reasonably certain that the exolever will engage the bifurcation. Extensive excision on the buccal surface in the region of the bifurcation should not be made, as such an excision will destroy a good fulcrum that should be available. The technic is similar to that described for a buccal excision where the crown is in a vertical position (Figs. 375, 376, pages 352, 353).

Exolever Technic.—Where excision has been made on the mesial, mesiobuccal, buccal and distal surfaces of the roots of the third molar, the exolever selected should be of such a design as can be properly adjusted to the surface made accessible by the excision.

Where the roots are not deflected or there is a lingual deflection, exolever No. 9L for the left side or No. 9R for the right side is selected. Where there is a buccal deflection, exolever No. 6L for the left side or No. 6R for the right side is selected. The exolever is adjusted to the mesial surface of the mesial root, and the roots, as in the case where the crown is intact, are directed distally and upward to a point where they are directed out of the socket. If this procedure is not practicable, on account of the character of the root formation, the roots are directed to a point where exolever No. 10L for the left side or No. 10R for the right side is adjusted to the buccal surface at the bifurcation, so that a wedge movement can be made between the roots and the superior border of the ossi-

structure in order to extract the roots. Occasionally repeated applications of the exolever are necessary, and, where no excision has been made at the bifurcation, the blade is usually sharp enough to excise the ossistructure when it interferes with a secure adjustment.

Where there is a large interseptum between the roots of the second and third molars, and the space will permit an exolever to be adjusted to the center of the mesial surface, exolever No. 11L or 11R is indicated. The blade displaces the gum tissue from over the roots, is directed toward the center of the mesial surface, and is then wedged between the latter surface and the ossistructure. The handle is turned mesially (Fig. 816), and the roots are directed upward and distally out of the socket.

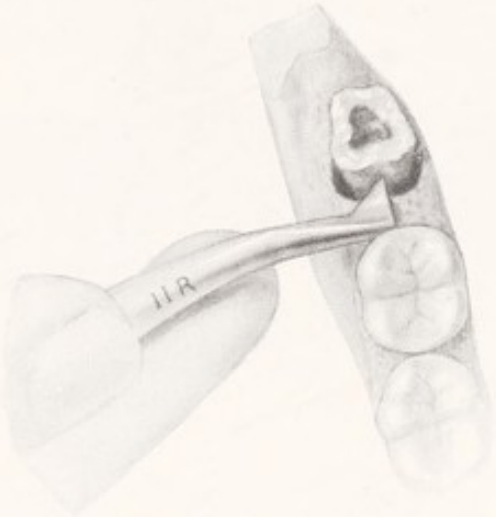


Fig. 816. — Mesial Application of Exolever—Roots of Vertical Impaction —Mesial Surface of Mesial Root Inaccessible. Exolever No. 11R applied to center of mesial surface, and roots directed upward and distally out of socket.

SEPARATION OF THE ROOTS

Where the line of fracture is quite a distance below the superior border of the ossistructure, making it difficult to excise in order to reach the mesial, mesiobuccal or buccal surface, or to excise distally to the distal surface on account of the distance for access, separation of the roots at the bifurcation, in some cases, will avoid causing considerable trauma.

Where the line of fracture is quite a distance below the superior border of the ossistructure, there is, as a rule, very little tooth structure remaining above the bifurcation, and separating the roots in such a case at the bifurcation will make the procedure more simple than excising for access to the mesial, distal or buccal surface of the roots.

Ossisector No. 7L or 7R is used for separating the roots at the bifurcation, and considerable pressure, under control, is necessary to produce the separation. The blade is applied on the buccal sur-

face of the remaining part of the crown structure at the bifurcation, and pressure is exerted to produce a fracture (Fig. 817), which is accomplished by creating a wedge, which often has a tendency to loosen the roots. When this procedure has been completed, the roots are extracted as in a case for extracting roots where they are separated at the bifurcation (page 787). Several ossisectors of the same design should be available, and the blades should be sharp in order that the technic may be executed definitely.

Where the roots are deep-seated, exolever No. 14L for the left side or No. 14R for the right side is indicated.

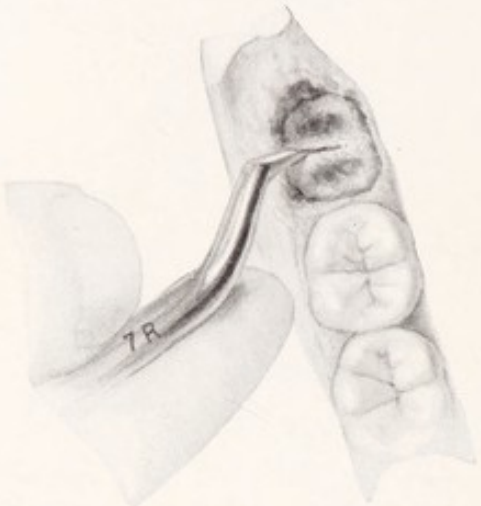


Fig. 817. — Separation of Roots—Roots of Vertical Impaction—Mesial Surface of Mesial Root Inaccessible. Ossisector No. 7R applied at bifurcation to separate roots.

SUMMARY OF CASES

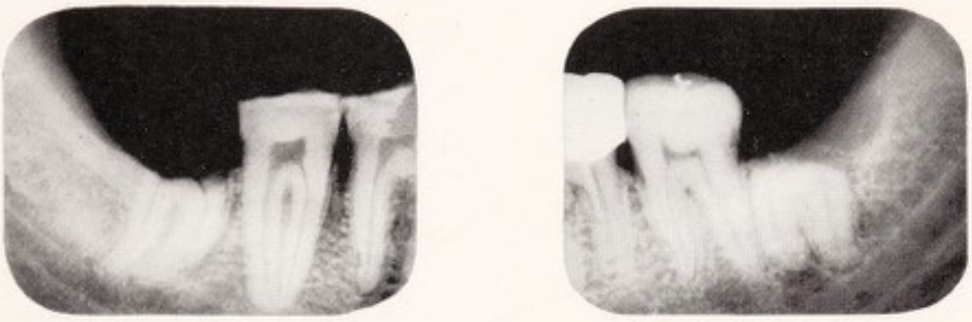
In the case shown in Fig. 818 A, where the mesial root is inclined distally and the distal root is straight, the line of fracture is even with the superior border of the ossistructure, with the ossistructure entirely over the mesial, distal, lingual and buccal surfaces. The occlusal radiogram (Fig. 818 B) shows the alignment of the third molar roots compared with the second molar roots. The ossi-

A B

Fig. 818. — Roots of Vertical Impaction—Mesial Surface of Mesial Root Inaccessible. Same case. *A*, lingual radiogram, mesial root inclined distally and distal root straight, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces; *B*, occlusal radiogram, showing alignment of roots.

structure on the distal surface of the distal root is excised, and excision is also made on the mesiobuccal surface. The exolever is adjusted to the mesiobuccal surface, and the tooth is directed upward and distally to a distance where a buccal application can be made to complete the extraction.

In the case shown in Fig. 819 A, where the mesial root is inclined distally and the distal root is straight, the line of fracture is even with the superior border of the ossistructure, with the ossistructure entirely over the mesial, distal, lingual and buccal surfaces. Excision is indicated on the distal surface of the distal root and on the mesial surface of the mesial root. The exolever is adjusted to the mesial surface of the mesial root to direct the roots distally into the space created by the excision made on the distal surface of the distal root, and this will raise the roots upward and distally



A B

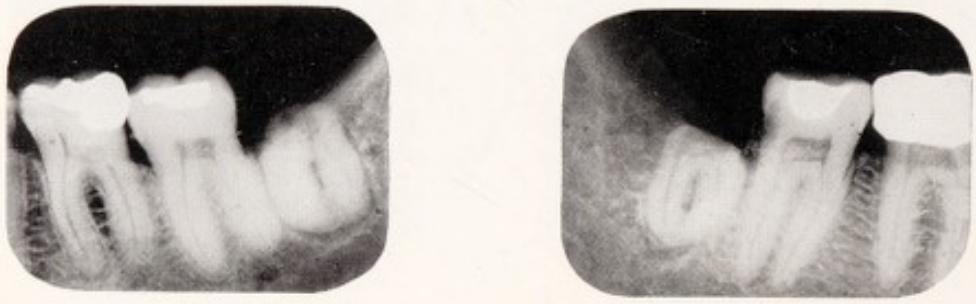
Fig. 819. — Roots of Vertical Impaction—Mesial Surface of Mesial Root Inaccessible. *A*, mesial root inclined distally and distal root straight, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces; *B*, same condition with exception of a contact of roots.

to a point where the exolever can be adjusted at the bifurcation on the buccal surface to complete the extraction.

In the case shown in Fig. 819 B, where the mesial root is inclined distally and the distal root is straight, the line of fracture is even with the superior border of the ossistructure, with the ossistructure entirely over the mesial, distal, lingual and buccal surfaces, and with the mesial surface of the mesial root of the third molar in close proximity to the distal root of the second. An occlusal radiogram should be made in this type of case to determine the alignment and to ascertain whether there is a buccal deflection. If there is such a deflection, it will be quite an advantage to excise anterior to that part of the mesial surface of the mesial root that is deflected out of alignment buccally with the distal root of the second molar. This procedure will also indicate the application of the exolever, utilizing as a fulcrum the ossistructure along that part of the mesial surface that is deflected buccally out of alignment with the distal root of the second molar.

The ossistructure on the distal surface of the distal root is excised. Where there is no deflection, excision is made along the mesiobuccal surface of the mesial root, the approach being made from the buccal surface. Sufficient excision should be made in order to apply an exolever, care being taken not to mar the distal root of the second molar. The roots are directed distally and upward by the application of the exolever to the mesiobuccal surface, and the extraction is completed by a buccal application.

In the cases shown in Fig. 820, where the mesial root is inclined distally and the distal root is inclined mesially, with a septum between them, the line of fracture is even with the superior border of the ossistructure, with the ossistructure entirely over the mesial, distal, lingual and buccal surfaces. This is the most difficult type of case on which to operate—where the roots remain on account of the difficulty of fracturing the septum between them. An occlusal



A B

Fig. 820. — Roots of Vertical Impaction—Mesial Surface of Mesial Root Inaccessible. *A*, mesial root inclined distally and distal root inclined mesially, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces; *B*, same condition with exception of no contact of roots.

radiogram should be made to determine whether there is a buccal deflection, and, if there is such a deflection, it will be quite an advantage.

The ossistructure distal to the distal surface is excised, and a second excision is made to gain access to the mesiobuccal surface, the latter excision being governed by the alignment of the mesial surface of the mesial root of the third molar with the distal root of the second. The exolever technic is executed with a blade that can be adjusted to the mesiobuccal surface, and sufficient pressure is exerted on the initial application to fracture the septum between the roots, as it will be quite a resisting factor. After the septum has been fractured, the roots are directed distally and upward to a point where the bifurcation is in alignment with or above the superior border, when the extraction is completed by a buccal application.

A buccal application without excision on the mesial and distal surfaces will not enable the operator to extract the roots, as the re-

sistance presented by the septum will be too great, and the roots must be first directed distally to overcome this resistance.

In the cases shown in Fig. 821, where the mesial root is inclined distally and the distal root is straight, the line of fracture is quite a distance below the superior border of the ossistructure, with the ossistructure entirely over the mesial, distal, lingual and buccal surfaces.

Excision to gain access to the mesial or distal surfaces is not a simple procedure, and an effort to minimize trauma while separating the roots at the bifurcation is the procedure indicated. The ossisector is adjusted near the bifurcation, and, with pressure under control, the tooth structure remaining above the bifurcation is fractured, and this will separate the roots. When this procedure has been completed, the roots are extracted as in a case for extracting the roots where they are separated at the bifurcation (page 787).

Fig. 821. — Roots of Vertical Impaction—Mesial Surface of Mesial Root Inaccessible. Mesial root inclined distally and distal root straight, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces.

In the case shown in Fig. 822 A, where the mesial surface of the mesial root of the third molar is quite a distance from the distal surface of the second molar, the operator should take advantage of the broad mesial surface, after the necessary excision has been made along this surface and on the distal surface of the distal root, for the adjustment of the exolever. By applying the exolever with pressure to the mesial surface, the roots can be directed distally and

A B

Fig. 822. — Roots of Vertical Impaction—Mesial Surface of Mesial Root Inaccessible. Both roots divergent, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces. *A*, no contact of roots; *B*, contact of roots.

upward to a point where a buccal application can be made to complete the extraction.

In the case shown in Fig. 822 B, it will be impracticable to follow the procedure described for the case shown in Fig. 822 A, as the relationship between the distal surface of the distal root of the second molar and the mesial surface of the mesial root of the third will interfere with the adjustment of the exolever to the center of the mesial surface.

The excision of the ossistructure on the buccal surface, which is limited to the area at the bifurcation, should be sufficient to allow the adjustment of the exolever, but not so extensive as to place the fulcrum too far away. The exolever is adjusted at the bifurcation with considerable pressure to create a wedge, and the roots can be extracted upward in line with their long axes, but repeated applications are often necessary to complete the extraction.

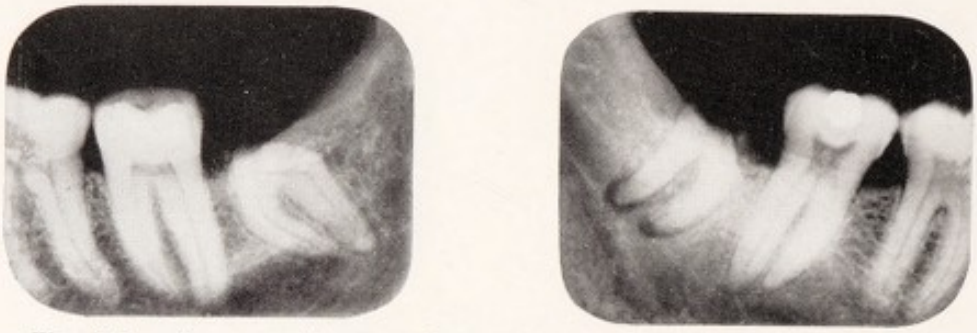


Fig. 823. — Roots of Vertical Impaction—Mesial Surface of Mesial Root Inaccessible. Mesial root inclined distally and distal root straight, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces.

The technic described for the case shown in Fig. 822 B may be followed in the case shown in Fig. 822 A if the operator chooses to avoid excision on the mesial and distal surfaces. If, however, in the case shown in Fig. 822 A, there should be a bifurcation of the mesial or distal root and unusual resistance be encountered, the resistance can be overcome to some extent by an excision on the mesial and distal surfaces. In such a case the exolever is applied to the center of the mesial surface to loosen the roots slightly, after which excision is made on the buccal surface at the bifurcation for the adjustment of the exolever, and the extraction is completed by a buccal application.

In the cases shown in Fig. 823, where the mesial root is inclined distally and the distal root is straight, the line of fracture is even with the superior border of the ossistructure, with the ossistructure entirely over the mesial, distal, lingual and buccal surfaces. Excision is indicated on the distal surface and at the center of the mesial surface, as there is sufficient space between the roots of the

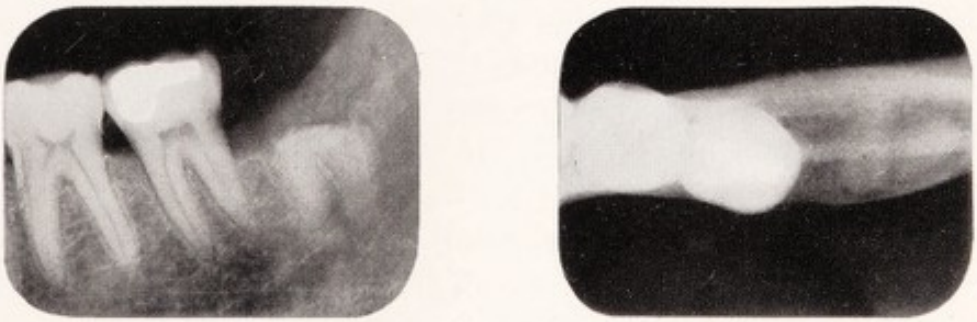
second and third molars to permit the latter excision. The exolever is applied to the center of the mesial surface to direct the tooth upward and distally to a point where a buccal application can be made to complete the extraction.

In the case shown in Fig. 824 the technic is the same as described for the case shown in Fig. 823.

A B

Fig. 824. — Roots of Vertical Impaction—Mesial Surface of Mesial Root Inaccessible. Same case. *A*, mesial root inclined distally and distal root straight, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces; *B*, radiogram of socket after extraction.

In the case shown in Fig. 825 A, where both roots are straight, the line of fracture is below the superior border of the ossistructure. The root formation indicates excision of the ossistructure on the buccal surface at the bifurcation, and the exolever is applied at this point to complete the extraction. In this type of case where there is quite a distance between the bifurcation and the superior border of the ossistructure, excision on the distal surface, over the roots, and at the center of the mesial surface is often a more simple procedure. As the operator is excising cancellous structure he will not find the excision so difficult, and the structure is not so dense to penetrate as when excision is made along the buccal surface at the bifurcation. In Fig. 825 B is shown an occlusal radiogram of the case. It is usually difficult to obtain access in this type of case, which has been overcome by increasing length of shank of ossisector and exolever.



A B

Fig. 825. — Roots of Vertical Impaction—Mesial Surface of Mesial Root Inaccessible. Same case. *A*, both roots straight, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces; *B*, occlusal view.

APICAL END OF A ROOT REMAINING IN THE SOCKET

Where a small part of the apical end of a root remains at the time of the operation, its removal will not be of a complicated nature, as the socket is open and the part can be reached with an exolever. Where, however, a part of a root remains as the result of a previous operation and the case is of long standing, there will usually have been a regeneration of ossistructure over the remaining part, and it will be necessary in such a case to excise the ossistructure in order to reach it. It is not unusual in a case of this character to find a pathologic condition around the remaining part.

CLINICAL EXAMINATION

As a rule the remaining part cannot be located by a clinical examination if it is below the superior border of the ossistructure, and lingual and occlusal radiograms will be necessary to determine its location.

RADIOGRAPHIC INTERPRETATION

Where a part of the apical end of a root remains as the result of a previous operation, the radiogram is studied to determine the size of the remaining part, the presence of a pathologic condition and the distance of the part from the superior border of the ossistructure and the distal surface of the distal root of the second molar.

OPERATIVE TECHNIC

Gum Tissue Technic.—An incision similar to that illustrated in Fig. 802, page 783, is made where the root end is not located very far from the superior border. Where the apical end of the root is located quite a distance from the superior border of the ossistructure, the gum tissue is incised distally in alignment with the buccal surface of the second molar to a point slightly distal to the remaining part. A second incision is made along the distal surface of the second molar, which, in addition to the first incision, will produce a flap that can be displaced to permit excision of the ossistructure and allow the application of the exolever. In an occasional case a slight incision is made lingually or buccally at the end of the distal incision to aid in displacing the flap.

Ossistructure Technic.—Excision for access is not so difficult as may be supposed when interpreting a radiogram of a case of this character. The removal of the apical end will be very difficult if the entire buccal plate is excised in order to reach the remaining part, but this procedure will be unnecessary, as the excision of the ossistructure between the lingual and buccal plates is the technic

indicated. It will not be so difficult to execute this technic as to chisel through the external plate in order to remove the apical end of the root through the opening made in this manner. When an interpretation of the apical end of the root has been made from the radiogram, ossisector No. 5L for the left side or No. 5R for the right side is selected to penetrate the cortical plate. When this procedure has been executed, excision is continued with ossisector No. 1L, 1R; No. 2L, 2R; or No. 3L, 3R. As the ossistructure between the lingual and buccal plates is of a cancellous nature, excision will not be difficult, and is made to a point where the operator is reasonably certain that the excision has reached the apical end of the root.

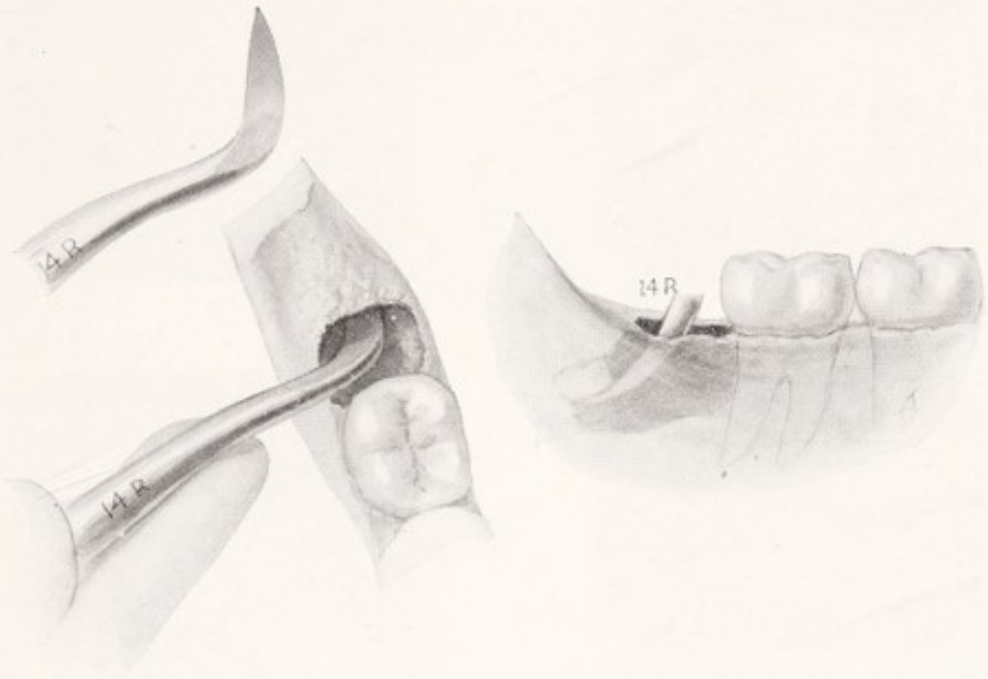


Fig. 826. — Mesial or Distal Application of Exolever—Apical End of Root. Exolever No. 14R applied below apical end of root.

Exolever Technic.—When the ossistructure in the region of the apical end of the root has been excised, the root can often be brought out of the socket with the blade of the ossisector. If this cannot be done with the ossisector, exolever No. 14L for the left side or No. 14R for the right side is indicated; the blade is long enough to reach the root end. The gum tissue over the excised ossistructure is displaced with the blade of the exolever, with which the remaining part is readily brought out of the socket.

In an occasional case it may not be possible to remove the remaining part of the root with the exolever, and in that case a curette can be used for this purpose. When applying the blade of the exolever, the point should be directed below the remaining apical end of the root (Fig. 826).

SUMMARY OF CASES

In Fig. 827 are shown four cases where the apical end of the root remains.

In Fig. 827 A the apical end remains at the anterior part of the socket, which is open and affords ready access, and no excision is indicated. Care should be taken not to injure the mandibular canal, on account of its close relation to the apical end of the root, when using the exolever to extract the remaining part.

In Fig. 827 B the apical end remains, with a slight pathologic condition around it, and it is in close relation to the mandibular canal.

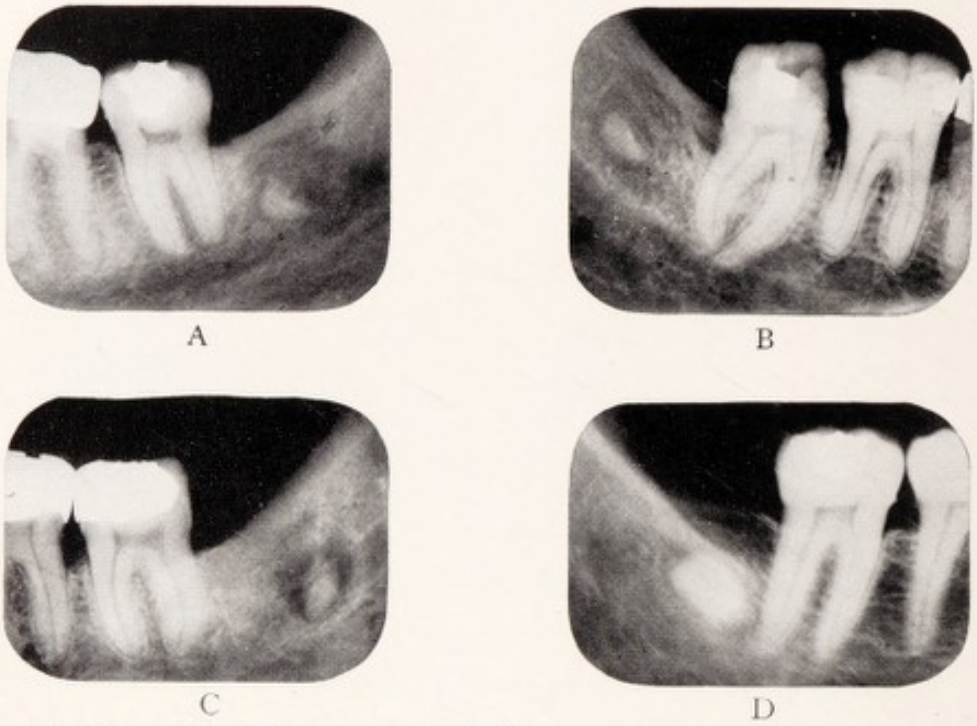


Fig. 827. — Apical End of Root. Different types of cases where apical end of root remains.

As ossistructure has regenerated over the root, excision is indicated between the lingual and buccal plates to a point where the apical end is reached, when it can be extracted with an exolever or a curette.

In Fig. 827 C the condition is similar to that shown in Fig. 827 B, except that the pathologic condition is more extensive. Excision is made over the remaining part between the lingual and buccal plates with the ossisector used to penetrate the cortical plate, after which the ossisector for excising the cancellous ossistructure, is indicated, when the apical end can be brought out of the socket with an exolever or a curette.

In Fig. 827 D the apical end of the root is in close relation to the distal root of the second molar and is some distance below the superior border of the ossistructure. Excision is made over the remaining

part, so that it can be removed with an exolever. The procedure in this case is not so complicated as in the cases shown in Fig. 827 B and Fig. 827 C, as the apical end is more accessible.

In Fig. 828 are shown three radiograms of the same case, which demonstrate the importance of making an occlusal radiogram of a case of this character wherever practicable.

In Fig. 828 A is shown a lingual view, where the apical end appears to be located in the socket. It will be observed that from a lingual view no definition can be obtained as to the relationship between the apical end and to the lingual or buccal part of the socket.

In Fig. 828 B is shown an occlusal view of the case described in

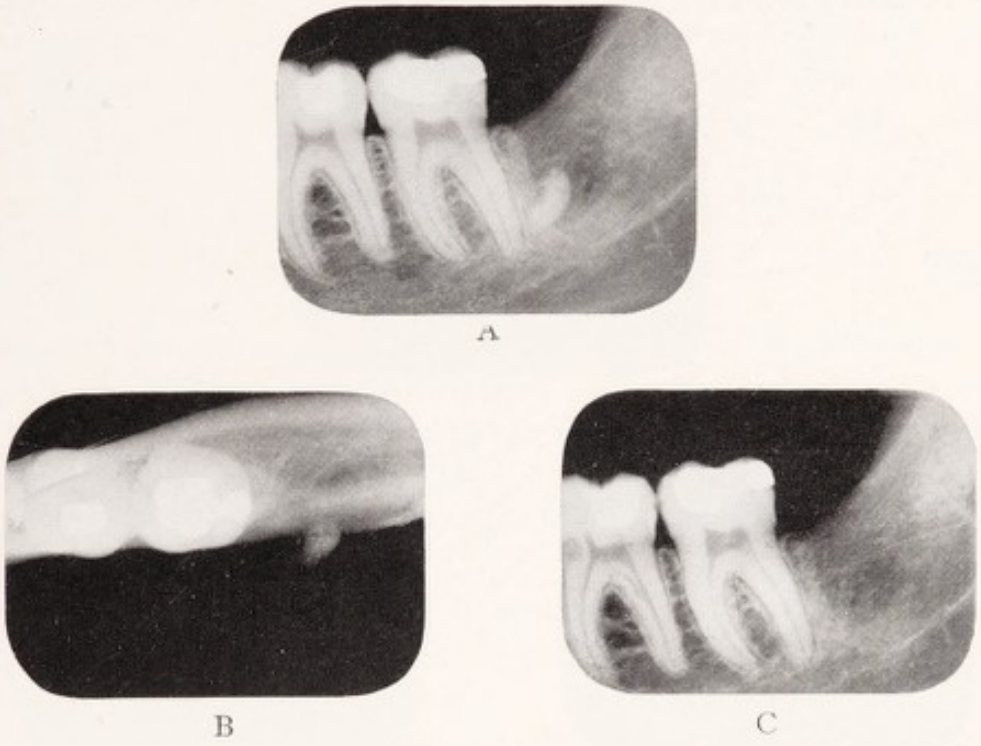


Fig. 828. — Apical End of Root. Some case. *A*, lingual radiogram where apical end of root appears to be located in socket; *B*, occlusal radiogram showing apical end of root deflected between gum tissue and ossistructure on lingual side of arch; *C*, part removed.

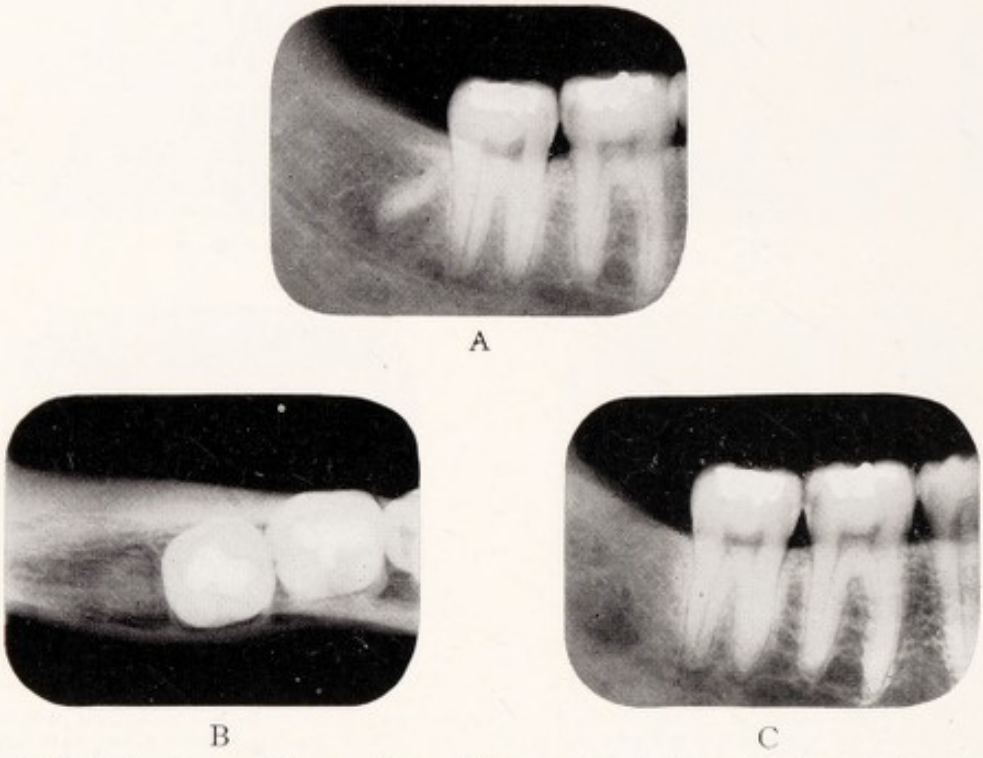
Fig. 828 A, which shows the apical end deflected between the gum tissue and the ossistructure on the lingual side of the arch. This condition indicates that no excision of the ossistructure will be necessary to gain access to the apical end, and incision of the gum tissue is all that is required to obtain access with a suitable instrument to remove the remaining part. In Fig. 828 C is shown the part removed.

In Fig. 829 A the apical end of the root of the third molar is in close proximity to the distal root of the second and is some distance below the superior border of the ossistructure. Excision is made over the remaining part in order that it can be removed with an

exolever. In Fig. 829 B is an occlusal view, which gives no positive definition of the location of the remaining part, and in Fig. 829 C is shown the case after extraction.

ISOLATED ROOTS

Where the roots of a mandibular third molar remain and are isolated, the condition is usually the result of a previous attempt at extraction, and in the majority of such cases both roots are usually straight. The cause of the fracture is, as a rule, due to an effort to direct the tooth too far distally with an exolever, or to an attempted forceps technic, which in this type of case is impracticable on account of the resisting septum, and the ossistructure on the buccal and lingual surfaces will not permit the roots to be directed lingually or buccally.



A

B C

Fig. 829. — Apical End of Root. Same case. *A*, lingual radiogram showing apical end of root; *B*, occlusal radiogram with no definition of location of root; *C*, socket after extraction.

Where a case of this kind is presented, a radiogram should always be made to determine the character of the root formation and its relation to the supporting ossistructure.

CLINICAL EXAMINATION

As a rule no definition of the character of the root formation or its relation to the ossistructure can be obtained by a clinical examination.

RADIOGRAPHIC INTERPRETATION

When the radiogram has been made, the operator determines the length and strength of the remaining roots, the location of the bifurcation, the character of the remaining tooth structure above the bifurcation and the relation of the ossistructure to the remaining roots.

OPERATIVE TECHNIC

Gum Tissue Technic.—It is sometimes difficult to determine the point of incision of the gum tissue on account of the isolated position of the roots, but by the insertion of a sterilized pin into the gum tissue and then the making of a second radiogram, the point of incision can be accurately determined. An incision is made along the entire mesial surface of the mesial root in alignment with this surface from the buccal to the lingual surface, and a second incision, when indicated, is made distally in alignment with the buccal surface of the roots to a point that will permit excision on the distal surface of the distal root and allow the flap to be displaced over the upper surface of the roots.

Ossistructure Technic.—Excision of the ossistructure is governed by the character of the root formation, but in most cases the ossistructure extends to the upper part of the remaining roots on the mesial and distal surfaces, in which case excision is indicated on both of these surfaces and in an occasional case on the buccal surface at the bifurcation of the roots.

Mesial Excision.—Where both roots remain and an application of the exolever to the center of the mesial surface is indicated, excision is made along the mesial surface to a point that will allow an adjustment of the exolever. This excision is made with ossisector No. 7L for the left side or No. 7R for the right side, and the gum tissue along the mesial surface is displaced with the back of the blade. Excision is made toward the center of the mesial surface of the mesial root, as illustrated for an isolated third molar where the mesial surface is inaccessible (Fig. 481, page 460). As the ossistructure is of a cancellous nature, excision is not difficult to execute.

Distal Excision.—Excision is indicated on the distal surface in all cases of this character, and is made with ossisector No. 1L or 3L for the left side or No. 1R or 3R for the right side. The excision is made as described for a distal excision where the ossistructure extends over the entire distal surface of the crown (Figs. 371, 372, pages 346, 347). The gum tissue over the upper surface of the roots is displaced with the back of the blade, and the blade is directed distal to the structure to be excised. The excision is made

toward the distal surface of the distal root, and this will create enough space on the distal surface to permit the exolever, when applied to the center of the mesial surface, to direct the roots upward and distally.

Buccal Excision.—In an occasional case, where the separation of the roots is necessary or where a buccal application is indicated, excision of the ossistructure at or distal to the bifurcation is indicated, which is made with ossisector No. 11L for the left side or No. 11R for the right side, as described for a vertical type of impaction (Figs. 375, 376, pages 352, 353). The gum tissue at the bifurcation is displaced with the back of the blade, and the blade, with pressure under control, is directed toward the bifurcation, excision being made on the buccal surface from the superior border of the ossistructure to the bifurcation. Not all of the ossistructure on the buccal surface, however, should be excised, and excision should be made only along the superior border of the ossistructure in the region of the buccal surface of the roots at or distal to the bifurcation.

Exolever Technic.—The exolever technic is governed by the character of the root or roots remaining.

Where only one root remains, whether it is the mesial or distal root, the procedure is the same as that described for the extraction of a single root (page 782).

Where both roots remain and are intact at the bifurcation, the exolever technic should be executed in conformity with their size and formation. Exolever No. 11L for the left side or No. 11R for the right side is used for this purpose, which is adjusted to the center of the mesial surface. The handle is directed mesially and the roots upward and distally, and the extraction is completed with exolever No. 10L for the left side or No. 10R for the right side by a buccal application at the bifurcation.

Where both roots are straight, it will be practicable in an occasional case to make excision of the ossistructure on the mesial and distal surfaces and to apply the exolever to the mesial surface to direct the tooth distally and upward, completing the extraction by a buccal application. Where a buccal adjustment can be made by a slight excision on the buccal surface at the bifurcation, the entire extraction can be completed by this procedure. Where, however, the line of fracture is quite a distance below the superior border of the ossistructure, the separation of the roots, as described on page 801, is indicated, and in such a case only a slight excision anterior and posterior to the roots is necessary. The exolever blade is wedged between them in order to extract the mesial root, and the distal root is then removed.

SUMMARY OF CASES

In Fig. 830 are shown four radiograms where the roots are isolated and remain as the result of a previous attempt at extraction.

In Fig. 830 A the distal root remains, and a slight excision on the distal surface of the distal root will simplify the operative procedure. The exolever is inserted into the empty part of the socket, and the point of the blade is directed toward the center of the mesial surface of the distal root. With the back of the blade resting on the anterior part of the socket as a fulcrum, the handle of the exolever is directed mesially, which movement will readily extract the remaining part out of the socket.

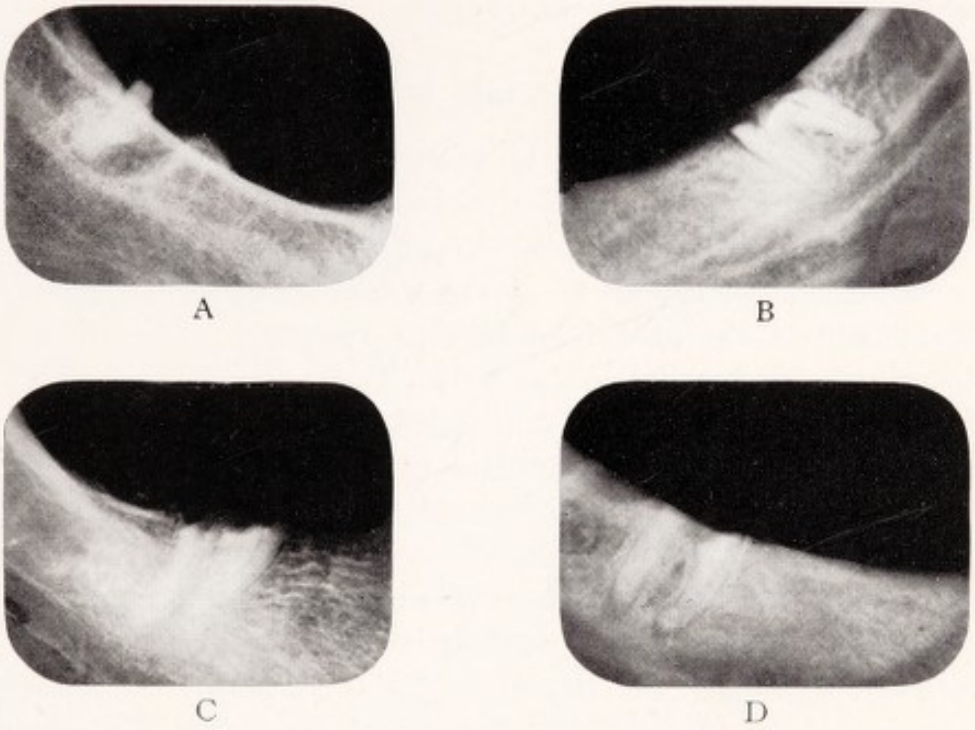


Fig. 830. — Roots of Vertical Impaction. Roots remaining of an isolated mandibular third molar, with a variation in types of cases.

In Fig. 830 B, where both roots remain, excision is indicated on the distal surface of the distal root and on the center of the mesial surface of the mesial root. The application of the exolever to the center of the mesial surface will loosen the roots and direct them to a slight extent distally into the space created by the excision on the distal surface of the distal root. When the bifurcation has been raised up to the superior border of the ossistructure along the buccal surface, the extraction is completed by a buccal application. In Fig. 830 C the procedure is similar to that described in Fig. 830 B. In Fig. 830 D, where there is a separation of the roots, they are extracted by the application of the exolever between the roots, excision being made first to a slight extent along the mesial surface of the

mesial root and distal to the distal surface of the distal root. Exolever No. 11L for the left side or No. 11R for the right side is indicated, and the point of the blade is applied initially on the buccal surface at the bifurcation and directed toward the center between the two roots, when a wedge movement is created.

The object to be attained in all of these cases, wherever possible, is to extract first the mesial root. The mesial root is extracted with the exolever designed for this purpose, after which the countermate of this exolever is inserted into the empty part of the socket, and the distal root is extracted by cutting through the septum anterior to the mesial surface of the distal root. With the back of the blade resting on the anterior part of the socket, sufficient pressure is exerted with the exolever to extract the distal root.

ROOTS OF AN ANGULAR OR HORIZONTAL IMPACTION

Where the roots remain as the result of a fracture of an impacted third molar in an angular or horizontal position, or where the crown has been destroyed by caries, leaving the roots intact, the operative technic is almost the same as in the case of extracting the roots in a vertical impaction, described in this chapter. The difference in the procedure will be that in the majority of cases the mesial surface of the mesial root is not in close contact with the distal root of the second molar, and the adjustment of the exolever can be made to the center of the mesial surface, as there will be no interference from the distal surface of the second molar.

Where the space between the mesial surface of the mesial root of the third molar and the distal surface of the second molar will permit the application of exolever No. 8L or 8R to be made to the center of the mesial surface of the remaining root or roots, this instrument is used in preference to exolever No. 11L or 11R indicated where the roots are in a vertical position.

Where the apical third of the roots remains, the distance for access in some cases, however, is greater than in the majority of cases where the roots remain in a vertical impaction and exolever No. 14L for the left side or No. 14R for the right side is then indicated.

The separation of the roots at the bifurcation where both are straight, which may be indicated in a vertical impaction, will not be necessary in the majority of cases of mesioangular impaction, as a distal and mesial excision, with the adjustment of the exolexer to the mesial surface and on the buccal surface at the bifurcation, will usually be sufficient to extract the roots.

The character of the ossistructure on the mesial and distal surfaces is interpreted in the radiogram in advance of the operation,

as excision is usually indicated for access to the mesial surface and in almost every case excision is made on the distal surface to permit the roots to be directed distally and upward. The excision for access to the mesial surface is usually in the cancellous structure and will not involve the external plate.

SUMMARY OF CASES

In the cases shown in Fig. 831, where the socket is open and the roots are accessible to the application of the exolever without excision, the blade is directed toward the remaining part, and, when the blade is adjusted, the fragment is brought forward through the open socket.

Fig. 831. — Root of Impacted Mandibular Third Molar. Distal root remaining and accessible without excision.

In the cases shown in Fig. 832, where the roots of a mesioangular impaction remain, the mesial surface of the mesial root is accessible and the distal surface of the distal root is free of ossistructure to a point where no excision is indicated. The application of exolever No. 2L or 2R to the mesial surface, with a degree of pressure, is usually all that is necessary in order to extract them, or, after the roots have been loosened, the extraction is completed by a buccal application.

In the cases shown in Fig. 833 A, where the roots of a mesioangular impaction remain, the mesial surface of the mesial root is inaccessible, and excision is made on this surface to gain access for the application of the exolever to direct the roots upward and distally after

Fig. 832. — Roots of Mesioangular Impaction — Mesial Surface of Mesial Root Accessible. Mesial root inclined distally and distal root straight, with part of mesial, distal, lingual and buccal surfaces free of ossistructure.

A B

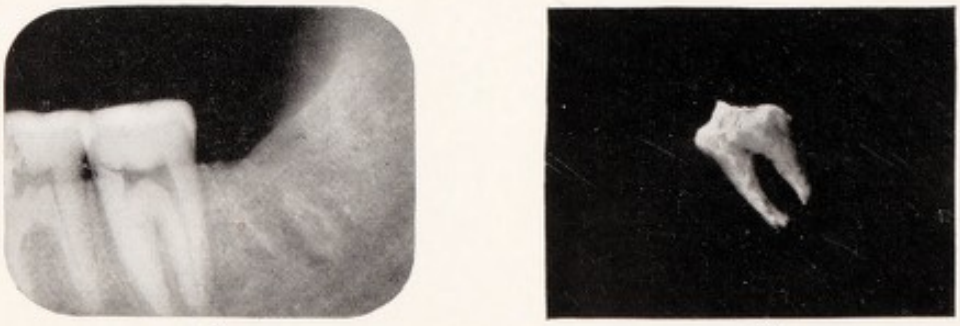
Fig. 833. — Roots of Mesioangular Impaction. *A*, mesial root inclined distally and distal root straight, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces; *B*, roots divergent, with ossistructure extending over entire mesial, distal, lingual and buccal surfaces.

the necessary excision has been made on the distal surface of the distal root.

In the case shown in Fig. 833 B, where the remaining roots are extremely long, excision is indicated on the mesial surface of the mesial root, on the distal surface of the distal root and on the buccal surface at the bifurcation. The roots are loosened slightly by the application of pressure on the mesial surface, and the extraction is completed by a buccal application.

In the case shown in Fig. 834 A, where the roots of a mesioangular impaction remain as a result of an attempted extraction, excision is made on the mesial surface of the mesial root and on the distal surface of the distal root. When the exolever is adjusted to the

A



B C

Fig. 834. — Roots of Mesioangular Impaction. *A*, roots of a size that are readily fractured, with ossistructure over entire mesial, distal, lingual and buccal surfaces; *B*, socket after extraction; *C*, extracted roots.

mesial surface in order to direct the roots upward and distally, the force applied should be sufficient to overcome the resistance of the septum between the roots. The precaution, however, should be taken to limit the pressure so as not to cause a fracture, as they are of a size that will be readily fractured. When the roots have been directed upward and distally to a distance where the bifurcation is even with or above the superior border of the ossistructure, a buccal application is made to complete the extraction. Figure 834 B shows the socket after extraction, and Fig. 834 C shows the extracted roots.

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